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BEA OFFERS UP PIECES OF FRAMEWORK TO JCP

Seeks standardization of new ideas

BY DAVID RUBINSTEIN

BEA Systems Inc. submitted three portions of its new WebLogic Workshop application development framework to the Java Community Process at last month's JavaOne conference in the hopes of having them accepted as Java Specification Requests and then approved by the organization.

The first piece of the framework is the concept of code annotation, which will allow developers to simply note something in code, such as making an application transactional, and a specialized compiler will read the annotation and act upon it as if it were code. "One of the overall keys to Workshop is to let regular developers play along with J2EE experts," said Benjamin Renaud, BEA's director in the office of the CTO. "If you want to do a complex transaction with two-phase commit and rollback, you need to know the Java Transaction API, and it will take about 200 lines of code to get it right." With the new technology, Renaud said, "an application server sees the annotation and starts the transaction. No code has to be written."

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Apache Wins Greater Access To Java Specs

EC vote used to sink daemon JSR

BY ALAN ZEICHICK

The Apache Software Foundation is flexing its muscles. Apache, which serves on Sun's Java Community Process J2SE/J2EE executive committee, recently torpedoed a third-party Java Specification Request (JSR), and forced changes to the Java Service Participation Agreement (JSPA) to make Java specifications more accessible to open-source developers.

In early March, the J2SE/J2EE executive committee voted not to perform a public review of a draft of JSR-96, for Java daemons. The JSR was subsequently withdrawn by its expert group, which is the group of companies working jointly to develop the specification.

JSR-96, which was chaired by specification lead Thomas Kopp of Dialogika GmbH, was described by its expert group as supplying a small container framework for developing and deploying independently running services. The goal, he said, was to fill gaps caused by the different handling of independent services running on existing native platforms.

The Java daemons effort fell within the purview of the JCP's 16-member J2SE/J2EE executive committee. There are two such committees, the other covering J2ME specifications; the executive committee votes on each JSR at several stages during the specification's development. In early March, the J2SE/J2EE executive committee was asked to vote on whether JSR-96 was ready for public review.

During the vote, Apache, which is a member of both the executive committee and the JSR-96 expert group, voted "no," stating: "The spec lead pushed this to community review without [expert group] consensus, there are security concerns regarding the inter-

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Oracle Adds XML Features to 9iDB Release

Company takes another opportunity to bash IBM, Microsoft

BY ALAN ZEICHICK

Ever since December, Oracle Corp. has been quietly discussing the creation of an XML database as part of its database product family. The project, code-named Project XDB, was briefly hinted at during the Oracle OpenWorld conference as a possible new product. But now it transpires that rather than creating a new native XML database, Project XDB refers to a set of XML features that will ship as part of the company's forthcoming Oracle9i Release 2, promised by midyear.

Essentially, said Robert Shimp, vice president of marketing for 9i database, Oracle plans to use the 9i database to store XML data in traditional rows and columns using a new feature called XML DB. "This technology provides the ability to unify XML data and relational data in a single database that can be indexed and accessed through a single SQL command."

XML DB, he explained, "uses the object-relational capabilities in our database to store XML components in the rows and columns of the relational database, so you can do SQL access on the XML as if it were relational data, and you can output relational data as an XML document."

What about a dedicated XML database from Oracle? Not likely. "Customers are looking for a single database architecture that can handle all of their XML and all of their relational data," claimed Shimp, "rather than having to buy specialized XML data stores that run alongside of their relational databases."

A dedicated XML database is not likely, said Oracle's Shimp.

He added that the XML DB feature uses the W3C's XML

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MENTOR ACQUIRES ATI, IKOS

Nucleus RTOS, codelab tools key to purchase

BY EDWARD J. CORREIA

SAN FRANCISCO — Mentor Graphics Corp. in March acquired embedded systems developer Accelerated Technology Inc. for an undisclosed sum, augmenting its embedded systems division with ATI's Nucleus royalty-free RTOS and codelab application testing tools. Mentor, which develops and markets embedded software and hardware design and verification tools, plans to absorb all 150 of ATI's employees, bringing its total staff to about 3,500. ATI staff will remain in Mobile, Ala. Also in March, Mentor signed an agreement with IKOS

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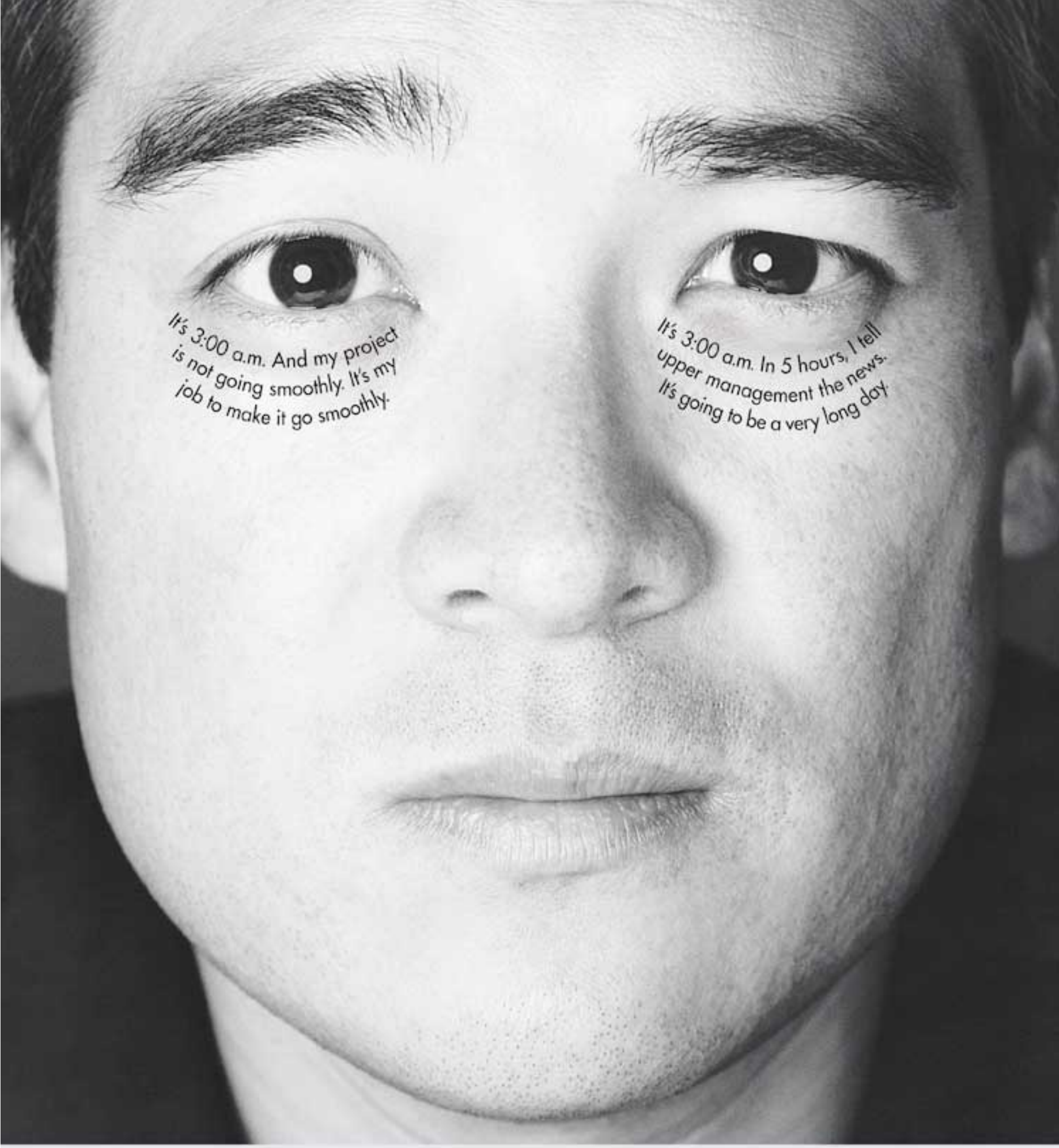
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Sun Releases Forte For Java 4 to Beta

BY EDWARD J. CORREIA

Sun Microsystems Inc. has released to beta Forte for Java 4, the latest version of its Java IDE that now incorporates C/C++, FORTRAN and Java languages in a single environment, natively supports SOAP, WSDL and UDDI Web services protocols, and can be used to target J2EE 1.3-compliant application servers. The new version is scheduled for general release in June, according to Sun.

Providing the unification is a new version of Forte Developer 7, Sun's C/C++ and FORTRAN environment for developing Web services wrappers for legacy applications. Forte Developer 7 is now based on NetBeans, the open-source development tool platform, which according to Drew Engstrom, product line manager for Forte for Java, benefits development teams by providing a consistent user interface and debugging environment regardless of language.

Engstrom said that multilanguage capability was an important precursor to enabling Forte to create Web services, the protocols for which are now implemented natively rather than via an add-on module.

Adding to the enterprise and community versions for building J2EE and J2SE apps, Forte for Java 4 will introduce a Mobile Edition, a scaled-down version of the IDE designed to target CLDC/MIDP devices. "We took out some modules that wouldn't be appropriate for mobile developers, like Swing and AWT, and some of the CORBA and RMI stuff," said Engstrom, adding that the modularity afforded by the Forte architecture helped to simplify creation of the Mobile Edition.

The Mobile Edition includes a unified emulator interface (UEI), which according to James Allen, senior product manager for Forte for Java, can greatly simplify debugging of MIDlets, applications created to the MIDP specification. "If you have a vendor with an emulator, they've got to integrate that with multiple IDEs, each with its own interface. The UEI benefits developers in that any emulator that implements this interface can be automatically mounted by Mobile Edition," and will automatically integrate within the developer's debug cycle.

Sun is hyping the news of Forte Developer 7's NetBeans compliance a bit more than usual, which Engstrom admitted was in response to recent press that IBM's Eclipse Project has been getting. ▮

IPLANET GRAVITATES TO SUN

AOL pact ends, Sun airs plans for software servers

BY DAVID RUBINSTEIN

The partnership between Sun Microsystems Inc. and AOL-Time Warner that led to the creation of the iPlanet software organization was allowed to expire last month. As a result, iPlanet is no longer a "Sun-Netscape Alliance"—it is now officially a division of Sun, and recent announcements by Sun show the iPlanet intellectual property will play an important role in the company's software offerings.

The decision not to renew the agreement, according to Sanjay Sarathy, Sun's director of developer enablement at iPlanet, was mutual. "The original agreement was structured in that Sun retained all intellectual property and AOL received financial payments as a result of the sales from these products," he said. "From a business perspective, [iPlanet] fits far more into Sun's overall strategic business plan than it does AOL."

Through iPlanet, Sarathy said, Sun now has competitive directory servers, Web servers and portal servers. The company has submitted a proposal to the JCP to create a portal API standard, added support for the Java Connector Architecture within the portal server, and issued a service pack to its EAI integration server.

Adam Abramski, product marketing manager for portal services, said Java Specification Request 168, proposed by both Sun and IBM Corp., addresses building standard APIs to allow portal components—"portlets"—to interoperate, creating a common way of aggregating content. "We want to extend J2EE to the portal or desktop side," Abramski said. He explained there are many APIs for portals to use, covering such topics as personalization, security or user management.

Sun's service pack for the integration server includes added Web Services Description Language (WSDL) file import capability. According to David Hearn, director of product marketing for business integration products, WSDL files can be imported directly into the server's transformation and business process management engines. An XML adapter designer also is now included for free.

"Over the next two years, integration across the silos that corporations have created is where people will be focusing," Hearn said. "They don't want to rip and replace." ▮

Christina M. Purpi contributed to this story.

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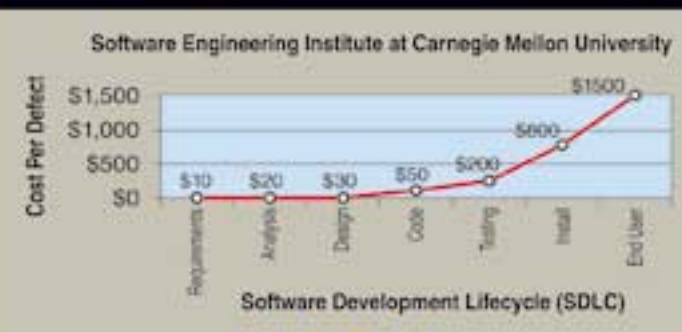

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Actional Switches SOAP

New infrastructure acts as Web services integration point

BY ALAN ZEICHICK

Platform-integration vendor Actional Corp. is moving into the Web services world with SOAPswitch, a server application that the company calls a gateway or router for SOAP messages. Said to be available on April 9, the product also can act as a front end for applications that aren't yet SOAP-enabled, if adapters are available.

"You can imagine that on one side of the switch there is a collection of SOAP-available services, while the other side also could be SOAP, but we also adapt to SAP, Siebel and other legacy packaged systems, as well as CORBA, COM and Java," said James Phillips, vice president of product management at Actional (www.actional.com).

"In a typical scenario, you have customers using Visual Studio .NET or the Apache SOAP engine with WebLogic, or some other tools, and they're attempting to use these new development environments to bring an application up very quickly," Phillips said. "These development environments let you consume SOAP-available services as an integration substrate. The problem is that nothing else out there is a provider of those SOAP-available services yet. SOAPswitch provides the ability to make it possible to use those great tools while leveraging your existing software."

Why not just put a simple SOAP front end onto those legacy or non-SOAP-enabled applications, and let applications communicate directly point-to-point? "There are other issues outside API adapting," said Phillips. "There's a need for this concentration point, as it solves other problems like availability and performance, SSL acceleration, content transformation, functions like that. You definitely want a layer of network infrastructure that's smart, that thinks at Layer 7 and understands Web services natively."

Phillips said that SOAPswitch can perform not only API translation and content transformation, but also the application of security policy enforcement and traffic loggings. "We want to be the proxy server at the SOAP and Web services level." It supports load balancing, he said, as well as mirroring for high availability.

"Look at what IBM and Microsoft, with their global XML Web Services Architecture, were trying to do, and what the WS-I [Web Services Interoperability Organization] was formed to do is to come up with markup at Layer 7, in the SOAP header, where you can start annotating things that the network can work on in an intelligent way," he added. "Look at the plethora of WS-dash specs that are rolling out of those guys—some public, some aren't yet—for security, transactions and eventing, and the ability to do transforms. This whole host of standards that are intended to, in effect, be implemented at the network infrastructure…this looks a lot like what SOAPswitch is."

SOAPswitch runs as a Solaris application on Sun servers, or as a native Windows application on a Windows server, said Phillips, and uses a browser-based control panel. It comes in two versions: SOAPswitch Professional Edition, at $10,000 per processor, which doesn't include high-availability features such as failover, and which can connect only to Java and COM services; and an Enterprise Edition at $50,000 per processor, which adds clustering and high availability as well as the connectors to packaged software. ▮

The SOAPswitch management portal displays the current load level and health of active Web services.

More Layoffs at Lineo

BY EDWARD J. CORREIA

More than half of the staff at Lineo Inc. was handed pink slips in March, reducing the number of people remaining at the embedded Linux developer to about 75 from its high of 320 last year.

Unlike its previous round of layoffs in late 2001, which then-CEO Bryan Sparks said were designed to help the company focus on its core competencies of operating-system and tools development, this year's cuts go right to the bottom line. "We had made a commitment to our investors and our board to be profitable by the middle of this year," said Matt Harris, who was named CEO last November.

Harris said that the expense reduction, when offset by a backlog of product and service revenue in excess of $5 million that he expects to fulfill between now and June, will be enough for Lineo (www.lineo.com) to be profitable by midyear.

Though a few were engineers, most of the layoffs came from Lineo's sales and marketing departments, which Harris said were "quite large for a company our size." Harris said the remaining engineers have been reorganized into three groups: one focused solely on handheld devices; another on set-top boxes, including residential gateways and digital television sets; and the third on Embedix, its core operating system and development tools. "If you didn't fall within one of those three groups, you ended up on the 'go' list," he said.

"You cannot cost-cut your way to a successful business," Harris added, "and in the long run, if you can't turn your company into a profitable one, you're not doing your employees, partners or your customers any good." ▮

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News Briefs

COMPANIES

Microsoft Corp. and **Altova Inc.** have collaborated to extend Altova's XML Spy 4.3 editing suite to work directly with Microsoft's SQLXML language. SQLXML is the language used by SQL Server 2000 to perform object-relational mappings . . . **PolarLake** announced that it is working with **SpiritSoft Ltd.** to combine its XML and Web services development suite with SpiritSoft's JMS server . . . **Micro Focus International Ltd.** plans by June to integrate its Net Express COBOL-to-Java wrapping technology into **Cape Clear Software Inc.**'s CapeStudio 3 development environment to allow developers to define and deploy COBOL applications as Web services . . . A planned interface, called PMConnex, is being developed to link the project requirement information of **Telelogic Inc.**'s DOORS with **Primavera Systems Inc.**'s TeamPlay project management software suites. PMConnex will be developed and sold by **Project Management Centre**, a partner of both companies, and is expected to be available this month. With PMConnex, project plan information can be tied to specific development requirements, according to the companies, allowing project managers to assign tasks based on an overall view of the project . . . **Microsoft Corp.** has released a "shared source" implementation of its Command Language Infrastructure to academics and researchers. The source code is available for Windows XP and FreeBSD operating systems, and the license terms specify that it cannot be modified or used for commercial purposes . . . **Sun Microsystems Inc.** has made available the Sun ONE Platform for Network Identity; when the Liberty Alliance specifications become available by midyear, Sun's platform will support federated network identity . . . **Microsoft Corp.** is supporting **UCCnet**'s item registry and data synchronization services. UCCnet, a not-for-profit subsidiary of global standards organization **Uniform Code Council Inc.**, delivers an open platform for compliance verification, synchronization of product information and registry. Microsoft plans to certify its BizTalk Server software as compliant with UCCnet services . . . The attendance at this January's LinuxWorld Conference and Expo was 9,468, compared with 18,839 from the year before, according to Rich Green, spokesman for producer, **IDG**.

PRODUCTS

Pramati Technologies is now shipping version 3.0 of both **Pramati Server**, a J2EE 1.3-compliant application server, and **Pramati Studio**, an IDE for building J2EE applications . . . Windows tools maker FMS Inc. has released several new utilities. **Total SQL Analyzer Pro**, which sells for $999 per developer, examines SQL Server configurations and offers performance tips to improve the scalability of databases. **Total Access Analyzer**, priced at $299, documents Microsoft Access databases and adds several administrative reports. **Total Access Detective**, $199, highlights changes to databases and database objects . . . MontaVista Software Inc. has promised a port of its **MontaVista Linux** to IBM Corp.'s new **PowerPC 440GP** processor, which was announced in March. The operating system will be available by October, according to the company . . . Excelsior LLC has a release candidate of its **Jet 2.5** tool, which converts Java applications into native Win32 executables, for download from www.excelsior-usa.com /jetdlbeta.html. The new release supports Sun's JDK 1.4 and has a graphical user interface. Internally it has faster memory allocation, reduced memory consumption and smaller executables . . . VisiComp Inc. describes **RetroVue**, which entered beta in March, as a "total recall debugger," as it logs every operation executed by an application and allows developers to search backward to see every change of program state. No date was given for general availability . . . Microsoft Corp. has a new SDK for its **Visio 2002** drawing tool. The SDK is focused on allowing Visual Basic developers to customize Visio, but also includes a set of C++ libraries for use with Visual Studio 6.0. The company also released the second beta of its **Visual J# .NET**, which compiles Java-language applications to the .NET Common Language Runtime . . . NeuVis Inc. has shipped **NeuArchitect 4.0**, a UML-based rapid application development environment. The new version includes synchro-

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ObjectVenture Pushes For Self-Describing Patterns

New markup language designed to encourage reuse

BY ALAN ZEICHICK

Is the world ready for another markup language? A small company, ObjectVenture Inc., believes that developers will adopt its PCML, or Pattern and Component Markup Language, that's targeted at simplifying component reuse and the adoption of pattern-based development.

Currently, the company has a draft of the PCML specification available at www .objectventure.com/pcml/pcml .html, as well as the specs for Source Code Macro Language (SCML), an XML-compliant language used to generate source code from PCML documents.

Bill Willis, director of engineering for ObjectVenture, said that the goal is to bring about practical software reuse through driving the adoption of pattern-driven development. "PCML is to give a self-describing nature to patterns, components and frameworks. It's an XML-based description of a pattern, which we're positioning as a standard language for interchange of patterns, and for applying patterns."

Currently, ObjectVenture has been working on PCML and SCML initiatives mainly on its own, but Willis explained that the company is trying to form a multivendor expert group to evolve the specifications. "There are some partners that have been involved with that, but there's not anything formal yet," he said, citing cooperation from Sun's Java Center and HP's middleware division. "We're hoping to get some other folks involved as well, to share this vision for automating the use of patterns within software development."

Willis said that the ultimate goal would be to submit the specifications to some larger body, such as the Object Management Group, the Java Community Process, OASIS or the World Wide Web Consortium. "I hope the expert group will help decide that."

The company already has released several products that use PCML and SCML, including ObjectAssembler, a J2EE-compliant developer tool for visually assembling components and generating code from patterns, as well as apps built from Apache's Struts Web-application framework. Currently, ObjectAssembler is delivered as a plug-in for Borland's JBuilder IDE. ObjectVenture also offers Roaming Wireless Framework, a Struts-based framework for wireless development available for ObjectAssembler.

In fact, said Willis, the markup languages concept arose out of the development of the Roaming Wireless Framework. "We needed a better way to hand off our framework to customers. Right now, you give it to them—you give them some documentation and source code—but it's still very hard to convey, in an easy way, how the framework is to be used, and best practices and patterns on how you're supposed to use it in certain situations. So, we wanted to give it a self-describing nature, and that's what drove the creation of PCML."

Founded in August 2000 under the name Roaming Media Inc., the company changed its name in January 2002. The ObjectAssembler tool was initially known as Roaming Studio, and first shipped in October 2000. ▮

Ashnasoft Tears Threads From Messaging

Utilizes pooled resources for 'high-reach' connectivity

BY DAVID RUBINSTEIN

Claiming that pooling resources holds the key to making messaging even more useful in scenarios where a variety of client platforms are occasionally connected to servers, 5-year-old Ashnasoft Corp. at JavaOne launched its AshnaMQ 2.0 Enterprise Edition Java Message Service solution into a crowded field of vendors.

"There are a lot of JMS players in this market," said Ashnasoft's founder and CEO, Imtiyaz Haque. "Why would we be the 20th guy on the block without a compelling story?"

The story revolves around the company's technology that lets clients share resources and "multiplies the things inside the server" in such a way that the server doesn't fail under load, he said, declining to elaborate further for what he said were competitive reasons. "Typically, a client is assigned a thread, and the threads deliver messages. This model works well for a few hundred clients." Haque claimed this is not an efficient way to deliver messages when many thousands of users seek to connect at once, and that it inherently prevents the kind of scalability that enterprises need at peak times. The company's Resource Optimized Architecture, he said, allows many topics, queues and clients to be loaded onto a single server, which Haque said underlies Ashnasoft's "high-reach" strategy of linking various clients that are occasionally connected to a server.

With the acceptance of Web applications as clients, he added, "we're stuck in a request/reply protocol. If you're doing an application where things need to change rapidly, or only one small bit of data on a screen changes, messaging comes into play." Ashnasoft (www.ashnasoft .com) allows for real-time messaging to Web browsers, which gives the Web application the responsiveness and interaction of a native client application, he said.

Messaging, Haque continued, is the right platform for solving wireless device issues such as wireless network problems and varied richness of the Web client, as requests can be queued up and dealt with when the device is connected to the network.

General release was expected earlier this month; pricing was not available at press time. ▮

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GemStone Offers Java Shared Memory

GemFire seeks to replace object persistence, messaging for communications

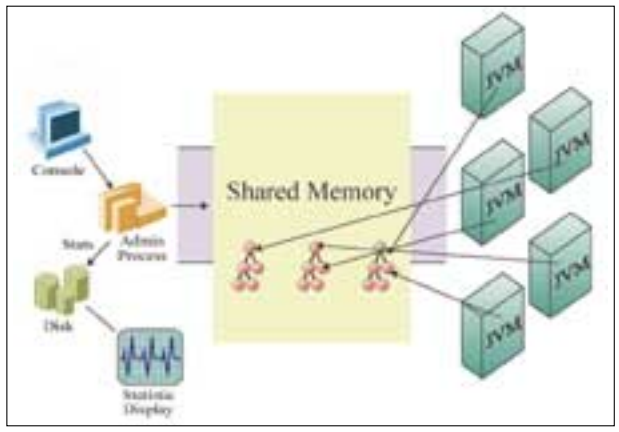
BY ALAN ZEICHICK

GemStone Systems Inc., which is best known for its J2EE and Smalltalk application servers, has unveiled the new GemFire shared memory utility to solve what executive vice president Richard Lamb called a latency problem with interapplication communications.

"Our customers want to have huge spaces in memory into which they could bring their customer data or process data and deal with it, as fast as possible," Lamb said. GemFire, which was demonstrated at JavaOne in March, will begin beta testing during the summer, with the company anticipating general availability by the end of the year.

"Most data sharing today is done with persistence [using a database] or done through messaging systems," he explained. "Our customers were dealing with multiple gigabytes of information at a time, and using persistence to share and to communicate that data was just too slow." Lamb cited markets in which the new utility can be effective, such as financial trading, where market data, analysis and actions must be done in near real time.

"Out of that problem we came up with a notion of using shared memory to manage all of that data in real time," added Raj Kulkarni, GemStone's senior vice president for business development. "These large systems are running their operation with multiprocess architectures for a couple of reasons. Performance and scaling, of course, but also high availability. The notion of partitioning into a large number of components, and running those components in their own virtual machine or processes, is important. When I say a large number, I mean that some companies run between 50 and 300 concurrent processes on the server."



The GemFire architecture allows multiple applications running inside one or more Java Virtual Machines to share a preallocated block of system memory.

Kulkarni said that although some developers had home-grown shared-memory solutions, GemStone wanted to offer an off-the-shelf shared-memory component "that could be inserted almost nonintrusively into existing architectures in an incremental manner without making the programmer think about how to move objects back and forth between processes and the shared memory, or doing garbage collection." He claimed that by moving persistence from databases into memory, latency can decrease by as much as 98 percent, and that the communication can be as much as 40 times faster.

GemFire contains a C library, language-specific access libraries that allow applications to work with the shared memory, and several administration tools. Currently, the libraries work with Java and C on Sun's 32-bit Java Virtual Machine on Solaris. The company (www.gemstone.com) is planning to extend GemFire to work on other 32-bit and also 64-bit virtual machines, according to Kulkarni, as well as to support other languages such as C#. The company still hasn't determined a pricing model, according to Lamb. "We're evaluating price points in this stage of the marketing process." ■

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Embarcadero Describes Life Cycle

Ties data modeling, UML tools to application IDEs

BY DAVID RUBINSTEIN

Embarcadero Technologies Inc. has released version 5.8 of its Describe UML modeling tool with new integrations with IBM Corp.'s WebSphere Studio and the open-source Eclipse Workbench application development platforms, a move the company claims will continue to close the gap between data and applications.

"Historically a gap has existed because, depending upon the company, either data is king and applications are an afterthought, or developers get all the resources and the database is just there," said Nate Skinner, Embarcadero's product manager for Describe. "To be able to leverage database expertise with a modeling tool on the software side is huge."

Embarcadero (www.embarcadero.com) was focused almost exclusively on the database life cycle until its acquisition of Applied Software Technologies in October 2000 and its UML modeling software, now called Describe, according to Tom Grubb, Embarcadero's vice president of marketing. With release 5.5 of Describe last June, Embarcadero tied the tool to its ER Studio data modeling tool, allowing developers to create objects based on a database diagram in UML, he said. "The idea was to embed modeling tools into developers' favorite environments," Grubb said, citing earlier integrations with Sun Microsystems Inc.'s Forte for Java. The company is working with Microsoft Corp. to integrate Describe into the Visual Studio .NET development environment, he added, so Microsoft developers can create models by importing DevStudio projects into Describe.

"We're seeing UML more at the developer level," Skinner said, "but developers want to code, not create models. This gives them UML artifacts as a result of developing software" through round-trip engineering. "UML was analysis and design; it wasn't seen as being applicable to development, so people just didn't do it."

The IDE integrations, Skinner explained, provide "immediate visibility into the code. You launch the IDE as you would normally, and in a tab is Describe to see source files as model elements." In WebSphere Studio Application Developer, Describe now appears as part of the toolbar to create "a native connection that looks like the IDE and not Describe," Skinner said. Other new features in Describe 5.8 are the ability to reverse-engineer UML Sequence diagrams as well as Visual Basic, and enhanced import/export support for Rational Corp.'s Rose UML modeling tool and its proprietary XML implementation from Unisys Corp., Skinner said.

Developers seeking to reverse-engineer Sequence diagrams can simply right-click on an operation or method and get the diagram, which "goes beyond analysis of stubs and provides a look at the logic automatically," Skinner explained. The new version is priced at $2,995 per developer seat.

In the future, Skinner said, Embarcadero hopes to exploit the forthcoming UML 2.0 specification, which is expected to be completed this summer, to take advantage of the Common Warehouse Metamodel and to further component-based development. ■

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SilverStream eXtends to J2EE 1.3

BY CHRISTINA M. PURPI

In an effort to keep up with Sun's latest Java specifications, SilverStream Software Inc. expects to have updated all the pieces of its eXtend platform to be compliant with version 1.3 of Java 2 Enterprise Edition by the end of this month. The company also has added a new process manager to its Composer integration tool that's compatible with IBM's new Web Services Flow Language (WSFL). According to Steve Benfield, SilverStream's CTO, the updates are to eXtend Composer; eXtend Director, SilverStream's application framework; and eXtend Workbench, the company's development environment.

SilverStream (www.silverstream.com) has created the process management tool as an add-on to version 3.5 of Composer, which Benfield claimed is the first commercially available process manager that builds Web services based on the WSFL specification.

WSFL defines how to describe business processes in XML, explained Benfield. "It's a set of ways to think about business processes. It also works with Web services standards, such as WSDL."

Although WSFL is not a standard, "developing to a standard wasn't an objective," said Fred Holahan, vice president and general manager of e-business integration products. "We looked into several different specifications [before choosing WSFL], and we liked WSFL because it provides a way to do straightforward diagramming. Additionally, it gives you a way to hook into different business functions."

Holahan said that the process manager is a "point-and-click-type way to hook up to a Web service that already exists and to bring it into a diagram so it can become part of the overall process. In other words, it lets a businessperson define the business process and lets the tech people come in behind and fill in detail, letting the business people do what they do best, and the tech people do what they do best. It splits the task, so people can be much more efficient."

The process manager can be added on to Composer for an additional $20,000 per processor.

eXtend Workbench, SilverStream's Java development environment, now includes a conversion wizard to help migrate code from J2EE 1.2 to 1.3.

The latest version of Workbench, version 2.0, also includes improved team development capability, with support for source-code control systems such as ClearCase, CVS, PVCS and RCS. "This allows developers to hook systems up to source control…anytime a change in software is made, everyone sees it," Benfield said. Workbench is priced at $295 per user.

A J2EE 1.3 version of eXtend Director will be available sometime in April or May, according to Benfield. A J2EE 1.3 version of SilverStream's app server, currently in beta, is set to be released in the same time frame. ▮

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Mercury Puts Java Applications to the Test

Integrates load performance tool with two IDEs, co-develops JVM monitor

BY DAVID RUBINSTEIN

As the complexity and size of enterprise applications grow, the notion of testing earlier and more often in the application life cycle is gaining support. The key, according to Simon Berman of Mercury Interactive Corp., is to enable more collaboration between developers and testers, and two new collaborations announced by Mercury (www.mercuryinteractive.com) at last month's JavaOne Conference are designed to do just that.

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"No longer can developers build an application and throw it over to QA to get ready for deployment," said Berman, the company's director of product marketing. "Apps are being created in dribs and drabs; a Web service here, a component there…."

Mercury is attempting to kick-start earlier testing by integrating its LoadRunner performance monitoring tool suite within two Java development environments: Borland Software Corp.'s JBuilder and Sun Microsystems Inc.'s Forte for Java.

Within the IDEs, which are to be delivered at the end of May as free add-ins to LoadRunner, developers can create EJB unit test scripts to ensure that server-side beans function correctly; these scripts then become the same ones that will be used by the quality-assurance team for testing under load with LoadRunner, Berman explained. The developers can create the test scripts with future application performance in mind, placing the test in Mercury's TestDirector repository "to bring developers and testers together, checking in and out scripts," Berman said.

However, more problems can arise at the point QA performs load testing, Berman said; the Java Virtual Machine is a black box that does not allow testers to see any pitfalls. To overcome this, Mercury has teamed with Sitraka Inc. (www.sitraka.com) to create Sitraka JMonitor, a performance tool that provides developers a view inside the JVM to locate problems. From there, Berman said, developers would have to use other diagnostic tools, such as Sitraka's JProbe, to drill down to the offending line of code to correct it.

JMonitor adds to the metrics provided by the LoadRunner monitors, which cover such things as application, Web and database server performance. "We tell you where the problems lie, [and] these other tools then drill down into the code," Berman said.

JMonitor, which runs on Linux, Unix and Windows, is available now as an add-in to LoadRunner and sells for $4,995. ▮

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APACHE

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action of the daemon and daemon container, the object model does not follow standard Java programming idioms, and we perceive excessive overlap with JMX and don't see any interaction with related APIs such as the Java Isolate API (JSR-121)."

JMX is the Java Management Extension specification, JSR-3.

In a show of support for Apache, the executive committee representatives from 11 of the other 15 members of the expert group also voted against JSR-96.

Doug Lea, an independent member of the J2SE/J2EE executive committee, wrote: "This expert group must actually come to consensus before the JSR can progress to community review." And Apple wrote: "Apple is also concerned about the lack of consensus in the EG reported by Apache. If a particular spec can't reach consensus within the confines of an expert group, it's going to have difficulty gaining adoption in the public."

There were no votes in favor of the ballot. Four members did not vote.

Kopp, who wasn't able to participate in the voting discussion because he's not on the executive committee, was surprised by the outcome and clearly unhappy with the results. "We still think that the current proposal for a standard for Java-based daemons is, technically speaking, a very good one. This is acknowledged by other members of the expert group," he told SD Times.

"Unfortunately, there is one expert group member who is unhappy with the proposal—for reasons we do not really know or understand," he continued, obliquely referring to Apache's representative. "In the end, this member voted 'no,' although all his additions, which he submitted at an early stage of the process, were included in the expert group approach. That is, insofar as they made sense. This was widely discussed within the expert group and commonly accepted."

But, "from our point of view," said Kopp, "this expert group member was either unable or unwilling to understand the main issues of the proposal. Instead of offering technical arguments, he found fault with the discussion culture within JSR-96. Interestingly enough, he was the one to withdraw from the discussion at an early stage and do some other irregular things.

"Instead of submitting comments during the prereview phase," continued Kopp, "the EG member let the JSR go to community review, deliberately waiting six days before the [executive committee] vote was to take place to announce its 'no' vote through its EC representative. In so doing, the member offered arguments that did not reflect the real situation—the main argument being that there was no consensus in the expert group, which was untrue."

Indeed, he said, "since the spec is subject to an NDA, we cannot comment on any technical issues pursuant to the JCP rules. However, we would like to say that we do not share any of Apache's concerns, such as with overlap with JMX."

Although a thumbs-down by the executive committee allows up to 30 days for a correction and resubmission of the specification, the expert group withdrew the JSR. To date, five JSRs have been rejected by the JCP. The Java daemons specification was the 15th JSR to be withdrawn, but the first to be withdrawn due to a negative vote by the executive committee.

There seemed little choice, according to Kopp. "As the political clout of [Apache] is very strong, we did not see any chance of preserving our proposal without abandoning its key features. Consequently, Dialogika, as the spec lead, withdrew JSR-96 after the Community Review Ballot," he said.

OPENING THE TEST KIT

In late March, Sun modified the draft Java Specification Participation Agreement to accommodate Apache's complaints that the draft agreement did not allow expert groups to release reference implementations of specifications to be released under an open-source license. Sun also negotiated a private agreement with Apache to provide open-source developers and academic institutions with test compatibility kits at no charge.

Java Community Process rules stipulate that each implementation of a new Java specification pass the expert group's test compatibility kit (TCK). However, those TCKs are developed by the company leading the development of a specific Java specification—and that spec lead is allowed to charge license fees for access to the TCK. In some instances, the TCK might cost hundreds of thousands of dollars. In effect, those costs make it infeasible for Apache (www.apache.org), or other open-source groups such as JBoss (www.jboss.org) to create compatible implementations.

Apache, which serves on the JCP's J2SE/J2EE executive committee as a representative of the open-source community, requested that the JSPA, which is, in effect, the bylaws of the JCP, be revised to state that the TCK must be "easy to obtain" by nonprofit or academic groups that wish to create their own implementation of the specification.

At Apache's request, Sun made changes to the draft JSPA, currently open for public review as JSR-99, which accommodates both of those requests, allowing expert groups to use Apache-style open-source licensing for its reference implementations.

In addition, Sun promised that when the company itself serves as a specification lead, it would provide no-cost access to a TCK to qualified individuals, not-for-profit organizations, and educational institutions. This agreement is only for Sun-led specifications and TCKs, not those led by other organizations, but as most JSRs are led by Sun, much work done by the JCP falls under its conditions.

Because Sun negotiated this agreement privately with Apache, none of the other executive committee members SD Times spoke with at JavaOne were prepared to commit their companies to the same terms, though all supported the spirit of Sun's move.

Edward Cobb, vice president of architecture and standards at BEA Systems Inc. and a member of the J2SE/J2EE executive committee, said that due to the complexity of the legal issues regarding intellectual property, it would take time for the various companies' attorneys to review the issue.

According to Rob Gingell, a Sun vice president and chairman of the JCP, even providing free TCKs doesn't go far enough. "It is important to realize that the state of the art in conformance testing is such that for major specifications, the successful execution of the test suites can be a daunting experience," he wrote in a letter of intent to Apache.

Gingell added that the company also is planning to endow an annual scholarship program to help groups like Apache use the test compatibility kits, which provide support for TCKs offered by Sun; the scholarship will last for at least three years, and will be funded at approximately $1 million per year.

Apache accepted Gingell's proposed changes at the end of March, at the beginning of the JavaOne conference in San Francisco. A three-member panel, with representatives from Sun, Apache and another member to be named later, will decide on a case-by-case basis which organizations and institutions will receive free access to the TCKs. ▮

ORACLE

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Schema as its data model, as well as the proposed ANSI SQLX query language. "That's basically an extension of the existing SQL language that many database administrators already know." Oracle also is going to offer a prototype of XQuery, the W3C's XML query language. "It's still in the early stages. Oracle, like all of its competitors, is putting together prototypes for developers to play with."

The XML DB feature will be a standard part of 9iDB Release 2, he said, in both standard and enterprise edition.

Shimp followed up his comments about the product's features with unflattering comparisons to IBM and Microsoft—much in line with Oracle's current marketing tactics, which directly target those two companies.

"IBM's DB2 supports XML, but they have to do indexing of the XML outside the database, which is not practical for scaling database applications," Shimp claimed. "Also, their XML strategy is centered around DB2 for Unix, but doesn't focus on the dozen other databases they offer, like Informix and Redbrick."

When it comes to Microsoft, Shimp said, "they lack the object-relational database. Object-relational technology is critical with XML because that's how you create a hierarchical kind of structure inside the database. Without that, it's difficult to store and retrieve your XML documents effectively."

And there were swipes at what Shimp referred to as the "smaller niche XML database vendors."

"While they are focused on XML technology, they do have drawbacks; the most obvious [is] that the customer has to have a separate, unique XML data store, which requires more DBAs and more complicated integration with relational databases," he said. "Also, the XML databases are not as robust as the commercially available relational databases." ▮

BEA

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A Java Web services page that contains a price list, for example, can be turned into a transactional application simply by writing annotations to the procedural code underlying the page, Renaud said, adding that the annotation can be set as a property on a property sheet. "That's something Visual Basic developers are very familiar with," he said, emphasizing that programmers do not need to be expert in J2EE to develop apps in Workshop.

The second submission involves providing a uniform Web services-like interface to all resources in an IT ecosystem to give greater control over the resources and to create "a simple, intuitive, visual way for calling into other systems," such as CRM and ERP, he said. The interface will allow developers to see components and drag-and-drop methods into other applications; BEA's Workshop includes a code editor for drilling lower into the code view, Renaud said.

The third, and least mature, piece, he said, involves process management, and how a business process is represented. Renaud said he did not have any timetable for when the proposals might be accepted into the JCP. ▮

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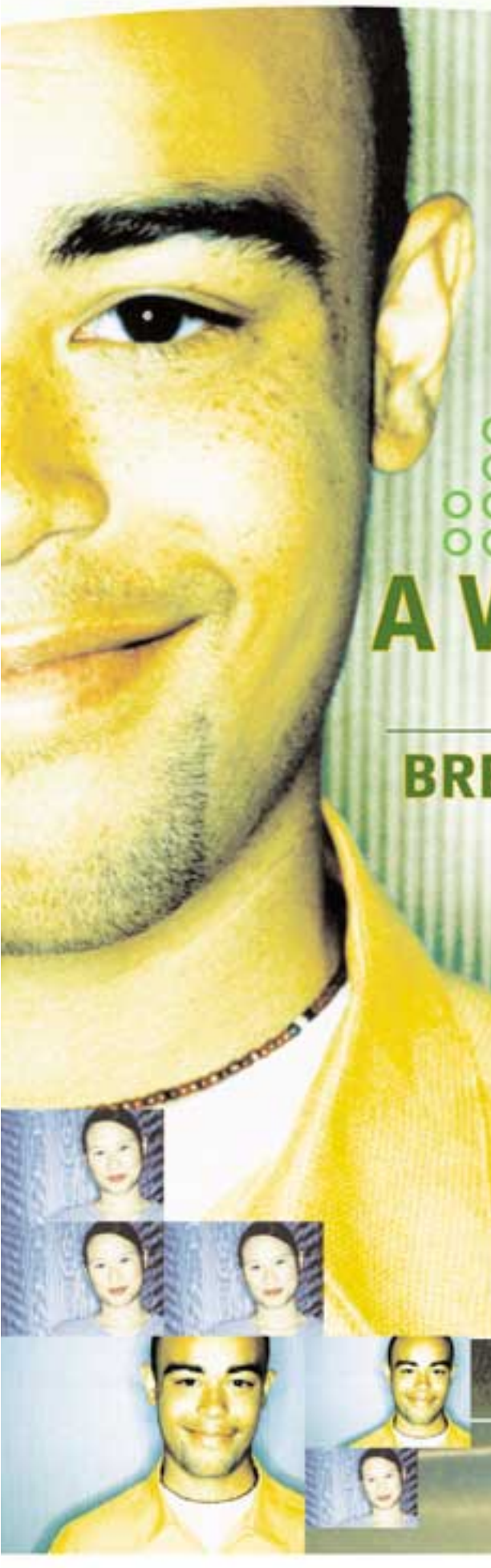

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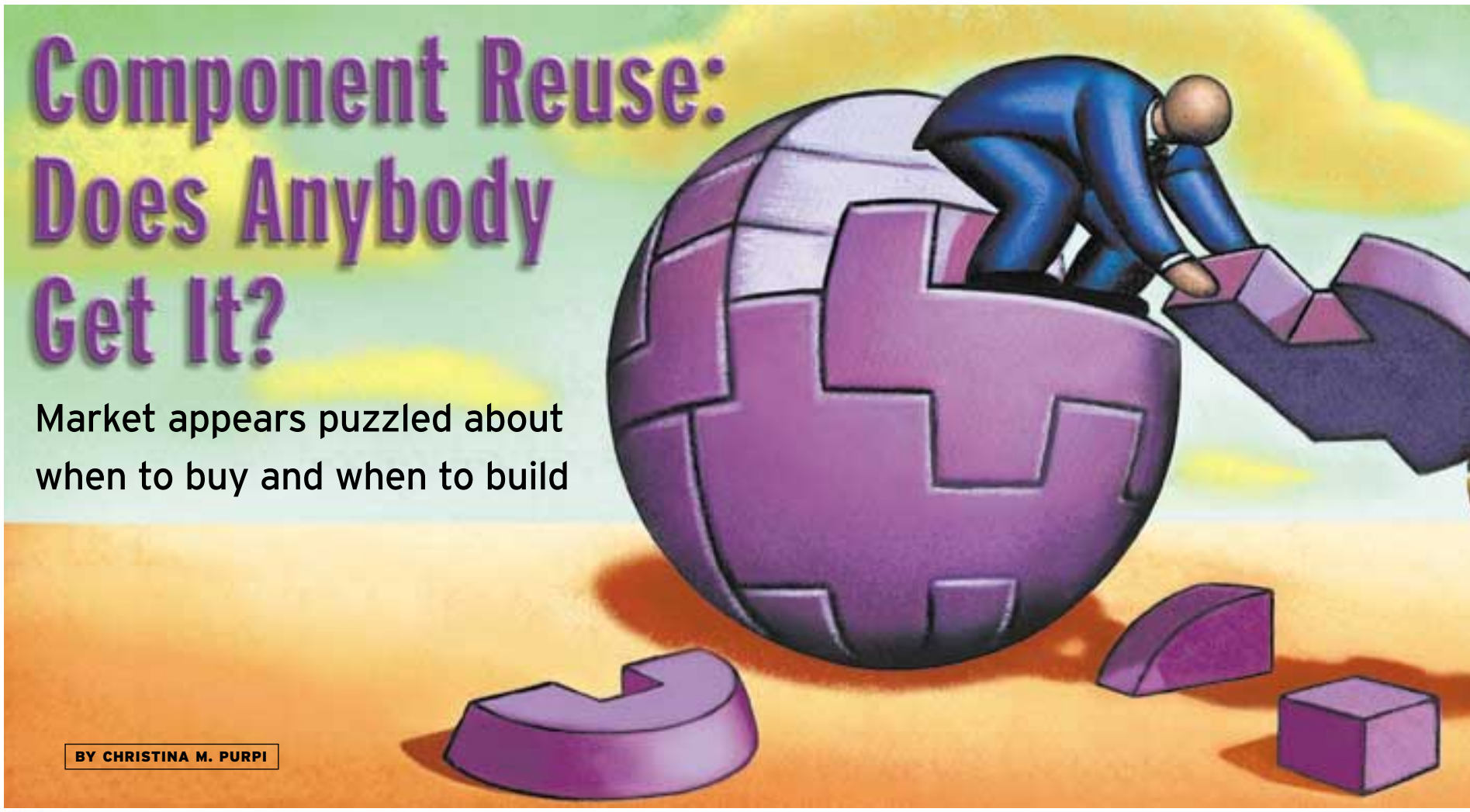
Component Reuse: Does Anybody Get It?

Market appears puzzled about when to buy and when to build



BY CHRISTINA M. PURPI

Automobile manufacturers share parts among different car "platforms" to save design time and gain manufacturing efficiencies. Newspapers and magazines use page templates so they don't have to lay out the same features day after day. Developers, too, would benefit from the use, and reuse, of components among varying applications. For decades this has been an important design goal of computer scientists, development managers and vendors.

With the rise of Windows' Component Object Model and Java's JavaBeans and Enterprise JavaBeans models, component reuse has been proven to be not only possible, but also effective. So, why haven't more developers jumped onto the component reuse bandwagon?

There are two models for reusable components. One is for the creation and sale of standardized parts from third parties. This model has seen success in the Microsoft Corp. space, particularly around user-interface components for Visual Basic developers. The second model is for in-house development, where programmers create their own libraries of reusable components, making them available to other developers on other projects.

Because it's difficult to quantify what developers do in-house, it's hard to determine whether or not in-house components are actually being built and consumed, and if they are being created, who exactly is using them. John Parker, senior analyst at Kinetic Information LLC (www.kineticinfo.com), said, "It's hard to measure what hasn't actually been sold." That's why most research on component adoption has focused on the market for commercial components, rather than in-house components.

According to some, the market for purchased components hasn't exploded the way one would think. Parker believes that the market is only about 10 percent of the way to its saturation point—where component-based development is just the way things are done. "The demand is there, but the supply is lacking," he claimed. "Developers are just now starting to get the picture."

Parker projected that in five years, nearly all will be reusing both third-party and in-house components. His advice for developers is to "always buy, but not in such a way that you get locked into a particular platform. Buy what you need, when you need it."

Evans Data Corp. (www.evansdata.com) saw this trend happening two years ago and stopped asking about components and component reuse because the topic was "no longer current." Results of surveys taken more than two years ago "always confirmed [the use of components,]" according to Janel Garvin, vice president of research at Evans Data. "Today we, and most of our clients, assume most developers use reusable software components."

THE MARKETS

There is some agreement about where component reuse is happening. Development seems to be an everyday occurrence in "areas where business processes tend to be complex and where there is a lot of emphasis on CRM [customer relationship management] applications, relative to the market as a whole," claimed Kinetic's Parker. "Areas where you have a large growing population of nontechnical users who have to access complex busi-

WEB SERVICES AS COMPONENTS

Web services is a major trend in the industry today, said Nicolas Robbe, technical marketing manager for ILOG Inc.'s industry solutions division. But how does the concept of Web services enter the picture? Does it have an effect on the future of the component market? "A component could be considered the 'service' in Web services," according to Mike Blechar, vice president of Internet and e-business at Gartner Inc.

Most people interviewed for this report agreed that Web services will help to further the rise of component reuse and component-based development. Greg Sherman, vice president of business strategy at LogicLibrary Inc., believes that "Web services are nothing more than hosted components. First, [Web services] will be used internally, just like component-based development." He sees them as becoming the catalyst for people to start looking at component-based development and the sharing of services.

With .NET, you have a new concept of Web services, said Odi Kosmatos, vice president of research and development at component maker Xceed Software Corp. "It's kind of like a component, but online, somewhere on the Internet. .NET makes components more powerful," he said.

"What you're going to see," continued Kosmatos, "is companies establishing themselves even more by being able to start doing business logic in components themselves. Application frameworks are going to be comprised of a basic set of preassembled components where you plug in your own business logic." In other words, "developers are going to turn into customizers of software."

Is Web services what the component market needs to take off? "It's too early to tell," said Sam Patterson, CEO of ComponentSource, who believes that Web services are just another form of components. He did say, however, that "the consumer side of the market will cause Web services to take off...[all companies need] is just getting the business model in order."

You buy research and development in the form of a component at a fraction of the cost, and you share the technology with whoever else buys these components, claimed ILOG's Robbe. "It's an extremely important step forward that is reshaping the future as far as component-based development." Why then do most people see more in-house development? Why isn't commercial component reuse more widespread? Only time will tell.

–Christina M. Purpi

.NET Vs. Java: Take Your Pick

Dominant component model is yet to be determined

BY CHRISTINA M. PURPI

When it comes to reusable components, which is better, Java or Microsoft's COM and .NET? According to those interviewed, the jury is still out.

Take Flashline Inc., for example. Java developers constitute three-quarters of its customers, said CEO Charles Stack. "We're seeing almost all of the interest and practice in the Java space."

According to Stack, .NET is too new. "There is a fair amount of interest in .NET" he said, "but we don't know. Development languages take a good four to five years to get up to speed, and .NET has a few years to go."

When asked if Flashline planned to turn some of its attention to the .NET space, Stack replied, "We'll focus on that when our customers are simply responsive and doing .NET implementations."

On the other hand, there are companies out there that develop solely for Microsoft platforms. For example, Xceed Software Inc. is a provider of only ActiveX and .NET components. Why? "It's because [.NET] is more structured and it's a lot easier to make money," said Xceed's vice president of research and development, Odi Kosmatos. With .NET, he claimed, there are only one or two platforms on which to develop, but with Java, there is a lot of competition. "As a component developer, you have to test on each and every one of those platforms. With Microsoft, you just write for Visual Studio."

According to Sam Patterson, CEO of ComponentSource, there is a 7-to-1 ratio of Microsoft to Java components available in the market. But if you compare .NET components with Java components, ".NET already has a lead on its own, but the split should come down to a 4- or 5-to-1 ratio as Java and Web services gain acceptance," he said.

Research done by ComponentSource in October 2001 of 100,000 developers actually adopting or evaluating .NET or Java, show that 79 percent are developing for .NET only, 14 percent for Java, and 7 percent for both.

Java has more traction for business logic, says LogicLibrary's Sherman.

Patterson also claimed that "debugging issues, deployment issues and application server compatibility issues are things that the Java camp has to tackle to make it easier for developers."

These days, components are becoming so widely used that Nicolas Robbe, technical marketing manager for ILOG Inc.'s industry solutions division, said that "the Java language itself is an assembly of components…you wouldn't necessarily call it component-based development, but it is what it is. You're reusing graphical toolkits."

ILOG itself sells components across all platforms, but according to the company, the majority of components sold are for the Java platform. "Visual Basic wasn't originally designed for component reuse as a set of objects," claimed Robbe. "The later the language, the more component-oriented it is."

From a developer perspective, the Java community is active in reusing components; it's a major trend in the Java community, Robbe said. "Microsoft was a bit behind in its old approach to component-based development. It was inflexible, hard to extend and hard to modify. Java introduced more flexible components, and .NET is pushing that a step further with a lot more capability than COM and ActiveX components."

Greg Sherman, vice president of business strategy at LogicLibrary Inc., sees different platform use with different types of component-based development. "More internal reuse occurs with Java, and more external reuse occurs with Microsoft technologies. A lot of Microsoft technology is developed around user interfaces, so to go out to the Web and buy a component to build a sliding scale, it's easier and safer, whereas Java has some of that, but has more traction for business logic where people are more reluctant to use components off-the-shelf in that area," he explained.

"Presently, the business end of things is going to drive the technical side," said Robbe. "Before .NET, that wasn't the case. You weren't able to leverage components…Java, on the other hand, is very natural, and you know the ease of use is there." ▮

ness processes to do their work [are also high in reuse]."

The commercial component market is largely owned by ComponentSource and Flashline Inc., according to Alan Brown, director of the developer accelerators initiative at Rational Software Corp. "They're the only two major companies making significant money; it's a hard area to make money in, and a lot of companies have gone under." While ComponentSource claims to have the largest repository of components for sale, and advocates component reuse through such efforts as the Reusable Component Specification and its own Enterprise Reuse Solution, Flashline focuses on its Component Manager tool, through which teams can either create, test and store their own components, or purchase off-the-shelf or custom components.

People don't have time to develop in-house, says Xceed's Kosmatos.

According to Greg Sherman, vice president of business strategy at LogicLibrary Inc. (www.logiclibrary.com), component-based development is popular in e-business. "There is a tremendous pressure to do it quick, so there is a ton of activity in that space."

IN-HOUSE VS. COMMERCIAL

Which market will grow faster: in-house and internal component development, or commercial marketplaces? Although data is lacking, the majority of people interviewed for this report believe that most component-based development is happening internally. Parker said that in-house development is more interesting and results in more business growth. "Organizations will continue to become global and merge, and a lot of interesting work will be done in-house."

Evans research done in early 2000 found that three-quarters of developers are using commercial components. However, only 12 percent were using commercial components in 100 percent of their applications, and almost 30 percent of developers aren't using components in any of their applications.

According to the same survey, more than 30 percent of developers use in-house components in 100 percent of their applications, and only 17 percent don't use them at all.

Charles Stack, president and chief executive of Flashline (www.flashline.com), claimed that approximately 40 percent of the Fortune 500 companies have component reuse initiatives. But where is that happening? "We're seeing a 10 [percent] to 18 percent quarter-over-quarter growth in the commercial market as a whole, claimed Stack, although he, too, said that "the vast majority of components are being developed internally."

Odi Kosmatos, vice president of research and development at component maker Xceed Software Corp. (www.xceedsoft.com), said, "Some companies still refuse to do anything outside their company." He doesn't see why, though, he added, because "the quality of available components is getting higher and higher, with the market maturing."

If you have large-scale components that get put into large-scale applications, significant changes usually have to be made for it to fit into development, Rational's Brown explained. "It makes people nervous because it's a lot of work." Kosmatos, echoing Brown's sentiments, said that a couple of years ago, developers wouldn't dare use something they didn't write themselves.

Kinetic's Parker, however, believes differently, saying that when companies start tying the business side of things to the development side, "it gets messy and not very productive."

Kosmatos said that with time-to-market being as important as it is in today's market, "people don't have time to develop in-house and are focusing on business processes more and more."

Stack said that one obstacle to an outburst of component development across the board is a lack of selection. "The components that people find are too general and not specific enough for their projects."

Another obstacle to the widespread use of reusable components, according to LogicLibrary's Sherman, is that when an enterprise purchases components commercially, it still has to customize them for its specific business logic, "which is why in-house development is fundamentally better and is catching on more." ▮

Hewlett-Packard

WebGain

Some things are just meant to be together.

Hewlett-Packard and WebGain have teamed up to simplify the creation and deployment of mission critical, e-business applications to HP Application Server 8.0 (HP-AS). The integration of WebGain VisualCafé and TopLink provides optimized performance on HP-AS and delivers an open, standards-based architecture streamlining application deployment. TopLink, the industry leading Java to data source integration solution, can help your company dramatically reduce development time and cut costs on application maintenance.

For free HP-AS 8.0 download and WebGain trialware, please visit
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News Briefs

MORE PRODUCTS

◂ continued from page 6

nization with Rational's Rose UML modeling, a Rational Unified Process plug-in and new code templates. NeuArchitect's applications can now run on BEA's WebLogic 6.1 and HP Application Server 8.0 . . . On April 22, SuSE Inc. will ship **SuSE Linux 8.0**, which includes the 2.4.18 kernel, glibc 2.5, KDE 3.0 desktop, Gnome 1.4.1 and a built-in firewall. Pricing for the *x*86 version starts at $39.95 per user. The company also announced availability of a 64-bit version of its **SuSE Linux Enterprise Server 7** for IBM's zSeries mainframes; previously SuSE offered only a 32-bit version . . . Atesto Technologies Inc. has shipped **Atesto Performance Suite Enterprise Edition 3.0**, its utility for conducting root-cause analysis of Web application performance problems. The update includes a load balancer for distributed performance testing and new tools for Web application monitoring. Pricing starts at $50,000 . . . **Code Once** is a new utility from GiveMePower Corp. for creating computer-aided design and other vector graphics for Windows and Windows CE . . . MapuSoft Technologies Inc. has released version 2.1 of its **OSChanger** migration tool, which it says permits developers to move their applications to Mentor Graphics Corp.'s Nucleus real-time operating system from other RTOSes. OSChanger 2.1, which sells for $4,995, also has been designed to run with Mentor's codelab embedded developer suite . . . Software distribution vendor Softwrap Ltd. has updated its namesake digital-right management software to include stronger security, new server-side application wrapping functions and user-interface enhancements. There is no charge to use **Softwrap 4.0**, but the company takes royalties of software sales . . . Rogue Wave Sofware Inc. has released a 64-bit version of its **SourcePro C++** tools suite to run on Intel's Itanium processor. The tools run under both Red Hat Linux and Windows XP . . . Trolltech AS has released beta versions of its **Qtopia** embedded user-interface software for Sharp's Linux-based Zaurus SL-5000D and SL-5500 handhelds. The betas are available in a free version for open-source development, and for $195 for a commercial-development version.

PEOPLE

Amnon Aliphas, founder of the International Conference on Signal Processing Applications and Technology, as well as DSP World Expo, has launched a new conference company, called Global Technology Conferences. The venture's first event will be Global DSP Expo, scheduled for March 30 to April 3, 2003, in Dallas . . . VA Software Corp. has added **Andre Boisvert** to its board of directors. Boisvert, who serves as a partner in several technology venture funds, was most recently president and COO of SAS Institute Inc. . . . **Thomas Lounibos** has joined Web communications software company Kenamea Inc. as president and CEO. Lounibos was formerly president and CEO of Dorado Corp., a financial services software provider . . . Microprocessor maker Zilog Inc. has named **Jim Thorberg** as its chairman and CEO; he had served as acting CEO since being brought to the company from its primary shareholder, Texas Pacific Group, in March 2001. Executive VP **Mike Berger** was promoted to president; he had joined Zilog in December 1998 as senior VP of worldwide sales . . . OSE Systems Inc. chairman and CEO **Ola Berglund** is also taking over the role of president, following the departure of former president **Mike Dager**. The company makes real-time embedded operating systems.

STANDARDS

The W3C has released three working drafts from its key management working group: **XML Key Management Specification 2.0** specifies protocols for distributing and registering public keys, **XML Key Management Requirements 2.0** specifies design principles and scope for key implementations, and **X-BULK** allows bulk key registration . . . The Java Community Process has released final specs for JSR-34, **Java Advanced Imaging API 1.1**. JSR-52, a **Standard Tag Library for JSP**, is available for public review. The community review draft of JSR-110, **Java APIs for WSDL**, has been approved, while JSR-96, **Java Daemons**, was voted down and withdrawn prior to its public review. ▮

Sprint Goes Java, Preps for 3G

BY EDWARD J. CORREIA

Wireless carrier Sprint PCS has added Java to its mobile phone development program. The company last month released the Developer Resource Kit, a set of free Java development tools designed to enhance J2ME development environments from Borland, Metrowerks and Sun. Borland and Sun also have agreed to distribute the tools with their IDEs.

Sprint's new tools consist of a set of Java classes, extensions and device emulators designed specifically for Sprint-distributed phones built by LG, Samsung, Sanyo and others. The tools are part of a Java strategy that Paul Reddick, vice president of business development at Sprint's PCS division, said has been a long time coming. "Nextel has been doing this for a while now, mostly in the corporate space. We've been saying [repeatedly] that we're gonna do Java, and the development community has been asking, 'How?' The news is that we're telling them how."

Among the tools are classes and methods for implementing and playing media clips, and what Reddick described as some useful generic and hardware-specific Java code. "We have our own extensions that we developed, some because we think they're clever and some because they didn't exist in [J2ME]. When we work with Samsung [for instance], we make sure the interface exists to make that phone vibrate," he said. The initial release will include emulators for Samsung A500 and N400 mobile phones. The software will plug into Borland's JBuilder MobileSet, Metrowerks' CodeWarrior Wireless Studio 7 Professional Edition, and Sun's Forte for Java 4, Micro Edition.

According to Reddick, the company (www.sprintpcs.com) believes that leveraging the abundance of Java developers will help it earn loyalty. "The reason we went with J2ME is to invite as many rich applications to run on our phones as possible. We're trying to get people to buy, use and keep their phones, and we think applications help that." He said the portability of Java also helps. "I want to be able to write [an app] once and run it all over the world. Java is a better choice [than proprietary] operating systems."

The tools arrive just ahead of an upgrade of Sprint's wireless network planned for this summer. Once in place, the company claims the so-called 3G network will allow applications to enjoy a burst data rate of 144Kbps, 10 times its present speed. And even though actual throughput will be a bit slower, Reddick said the benefits to developers will be obvious. "When you have 50 to 70 kilobits per second packet data always on, essentially you can do anything you can on a laptop," including efficient over-the-air deployment, Internet browsing and e-mail, he said.

Sprint's most capable phones will have preinstalled a WAP 2.0 browser, a J2ME virtual machine, XHTML capability and some amount of persistent memory for storing additional software, Reddick said. The company also hosts several horizontal applications, including scheduling and contact management data synchronization and an e-mail redirection service.

Reddick said the certification process for applications bound for its networks is not overly difficult. "We have an internal IT group that takes a quick look to make sure it doesn't crash or swamp our back end with packets." For enterprise applications and others not being offered for sale, Reddick said no certification is required. ▮

ELC Names Initial Working Group

BY EDWARD J. CORREIA

After taking some criticism over delays and indecision from some of its members, the Embedded Linux Consortium late last month named the working group that will begin to develop the APIs for the ELC Platform Standard for core operating system services, a minimum set of capabilities that all compliant embedded Linux devices will deliver.

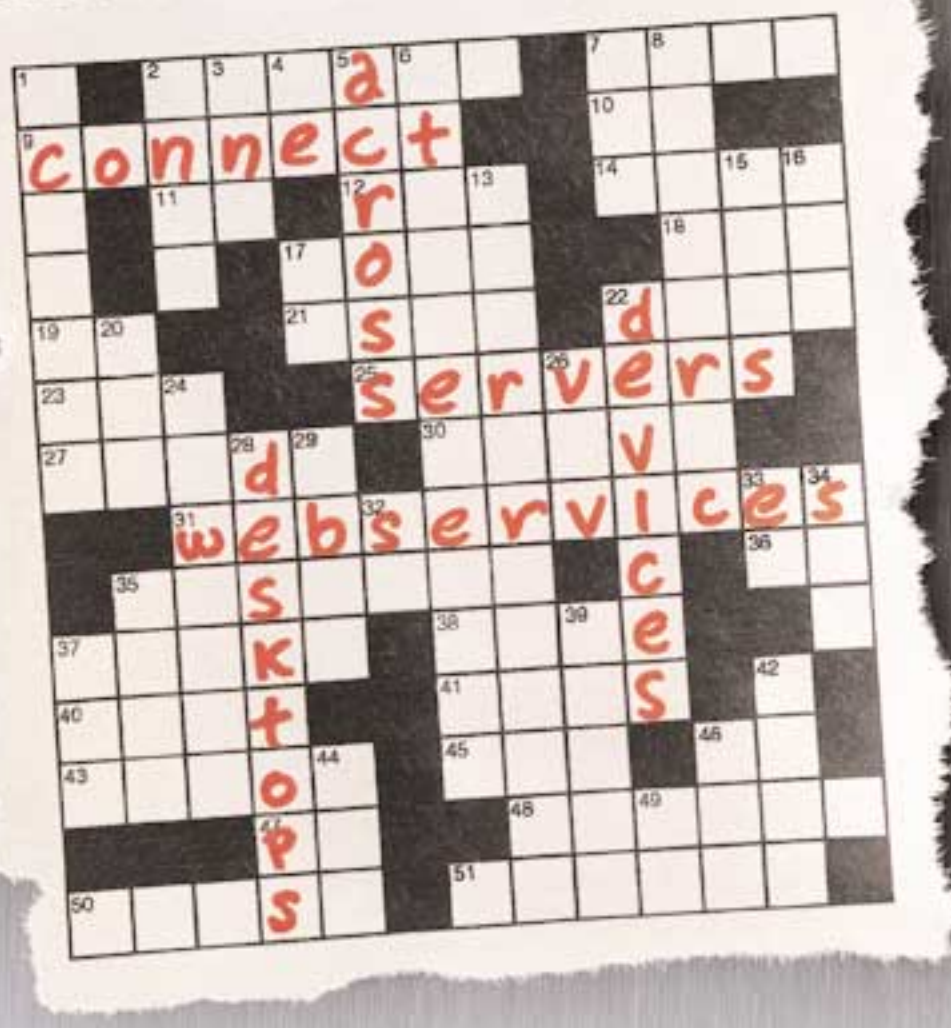
Since its announcement just a year ago of its intent to standardize embedded Linux, the ELC's board has been mired in delays due to indecision, legal entanglements and verbose deliberation—delays that were met with frustration from some members. But a breakthrough finally came last month to enable work that would, in theory, permit developers to build applications guaranteed to run on any compliant device, regardless of brand or which distribution of Linux is present.

Murry Shohat, the ELC's executive director, said the sudden move was not a knee-jerk reaction by the consortium. "There might be a small component of incentive and resolve to [the progress], but the map was created a while ago, and we're just executing the plan." Regarding the frustration voiced by members, Shohat said: "The need for speed was seen by the board. It has recognized that the marketplace wants what it's doing at an uptake rate that is far faster than anybody imagined. [But] standards [require] due process, and due process takes time."

The initial working group was scheduled to meet in April to elect officers and build a timetable for deliverables, and will consist of at least one technical person from member companies FSM Labs Inc., IBM Corp., LynuxWorks Inc., MontaVista Software Inc., Red Hat Inc., Samsung Electronics Co. Ltd. and Wipro Technologies.

The ELC (www.embedded-Linux.org) late last month reached a milestone when it agreed unanimously on how to distribute the intellectual property that would result from standardization and the creation of a compliance test suite, the group's main stumbling block to progress thus far. All members have reportedly signed the resulting intellectual property agreement.

ELC chairman Inder Singh said in a statement that he expects the core services APIs and compliance suite to be completed before 2003. Though he admittedly is doing none of the actual development work, Shohat said the goal seems reasonable. "Having sat in the room with these guys, the sense [among the working group developers] is that it's a very realistic goal." The organization will continue to accept working group proposals for noncore services until May 31. ▮



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New Tools Take Aim at Emerging Platforms

Wireless, mobile application targets abound at Embedded Systems Conference

BY EDWARD J. CORREIA

SAN FRANCISCO — Exhibitors at this year's Embedded Systems Conference held here in mid-March were demonstrating a variety of new development tools for a diverse array of new and emerging technologies. Many such solutions are targeted at mobile and wireless applications and the sophisticated hardware that will host them.

Embedded RISC processor maker **ARM Ltd.** has set a May release for its RealView Debugger, a new multicore debugging tool for systems designed with multiple ARM cores and those that include a mixture of ARM cores and a DSP core.

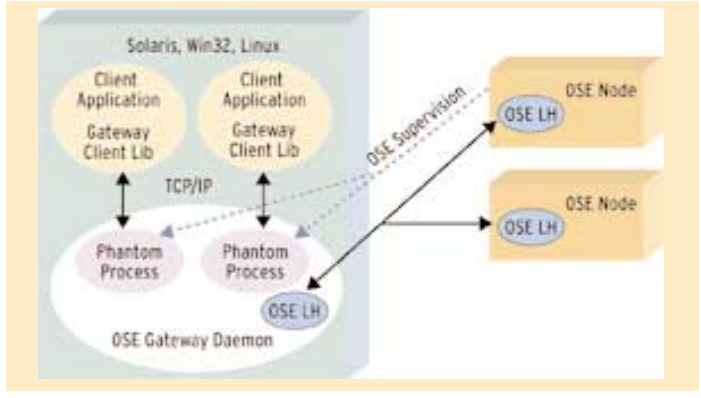
ARM's debugger is more flexible than others, claims Rayfield.

According to John Rayfield, director of research and development at ARM (www.arm.com), the RTOS-aware tool is more flexible than other multicore debuggers. "It's a much more generic solution that lets customers choose the multicore configuration they need [to debug]," he said. Rayfield said alternative solutions require developers to purchase separate debuggers for specific combinations of processors. RealView Debugger, which will sell for $3,000, integrates with the company's RealView Developer suite and Multi-ICE in-circuit emulator, and initially will support Nucleus, Symbian and ThreadX RTOSes. Rayfield said that ARM plans to increase the number of RTOSes supported by the tool, and that in the meantime, developers can integrate their RTOS with the debugger through a set of published APIs.

SD Times SHOW REPORT

Development tools company **Metrowerks Corp.** also will produce a multicore debugger. The company (www.metrowerks.com) said it will now include a quad-core debugger in its CodeWarrior Development Tools for StarCore Digital Signal Processor version 1.5, an IDE designed to target the MSC8102 DSP, which is produced by parent company Motorola for high-end networking infrastructure and packet telephony applications. Available now, the tools sell for $4,995. Metrowerks also released the CodeWarrior Development System, Embedded Network Edition, a hardware and software development system aimed at building Internet-enabled devices including kiosks, vending machines, cooking and refrigeration appliances, and security systems. The kit gives developers a choice between Motorola's MCF5272 or Embedded Planet's MPC850 or MPC860 development boards, and includes the corresponding CodeWarrior IDE for Motorola ColdFire or PowerPC processors. Also included are Lineo's RTXC Quadros RTOS and a sample Internet application.

According to John Smolucha, Metrowerks' vice president of marketing, the kit preintegrates all the necessary components of an embedded device. "If you're building a router, you probably know a lot about TCP/IP. But if you're connecting a toaster, you would have to evaluate a number of TCP/IP stacks. By the time you get the stack and RTOS running on the board, you're into 10 weeks, and you haven't even begun your application," he said. The kit is available now and is priced at $695 for an evaluation version or $42,500 fully licensed.



The OSE Gateway will permit dissimilar systems to interoperate.

Hardware maker **InHand Electronics Inc.** has released Elf2, the latest version of its 4x3-inch handheld computer development platform that now includes an improved LCD controller and options for a Bluetooth transceiver and Global Positioning System receiver. Designed for building devices that run Windows CE, the StrongARM-based Elf2 in its base configuration includes 8MB Flash memory (expandable to 32MB), 16MB DRAM (expandable to 128MB), 2 PC Card sockets, 12-bit audio and 14-bit telecom codecs and USB slave capability. A development kit sells for $3,995 and includes the company's power management software.

RTOS developer **OSE Systems Inc.** (www.ose.com) said it is working on software that will allow systems running Linux, Solaris, VxWorks and Windows to interoperate with those based on its own OSE RTOS, and to create heterogeneous distributed computing systems. According to the company, the OSE Gateway, which is scheduled to begin beta testing by midyear, implements OSE's message passing in a library that client applications on non-OSE systems can use to communicate with the OSE distributed system. Bob Monkman, OSE's chief technical strategist, said the software will give developers a new way to build fault tolerance into their applications. "Engineers now have the opportunity to exercise a high degree of creativity when designing high-reliability distributed systems for communications, networking and other distributed applications." Pricing for development licenses of OSE Gateway will start at $20,000.

Transvirtual Technologies Inc. (www.transvirtual.com) was demonstrating XOE, its Web services engine and embedded development framework for Linux and Windows that it claims permits developers to build and deploy embedded mobile applications more easily and in less time than competitive solutions. According to Patrick Schork, XOE product manager, the tools combine Java, XML and XHTML specifications and let developers build applications in the language of their choice. "You're using interfaces you already know to rapidly develop applications," he said, adding that the system also lets developers custom-brand their devices. "There's no 'Start' button here," he said.

The system also includes a package delivery mechanism that Schork said automatically sends any software updates to all client devices. "When the application runs, it checks to see if there are updates available. If there are, it downloads them," keeping field applications always in synchronization, he said. The company also offers XOE Developer Studio, a set of Eclipse-compliant IDE plug-ins for Linux and Windows. The system works with any application server capable of running SOAP; client devices require only a JVM. The software is available now; pricing is based on volume. ▮

MENTOR

◂ continued from page 1

Systems Inc. to acquire the maker of hardware-assisted design verification tools for $11 per share in cash. "Mentor will now offer a broader range of emulation products and price points," said Mentor's CEO, Walden Rhines, in a statement.

Former ATI president Neil Henderson, who spoke with SD Times at the Embedded Systems Conference in March, will continue to run all of ATI's operations and will pick up management responsibility for Mentor's RTOS division. His new title will be general manager of Mentor's Embedded Systems Division.

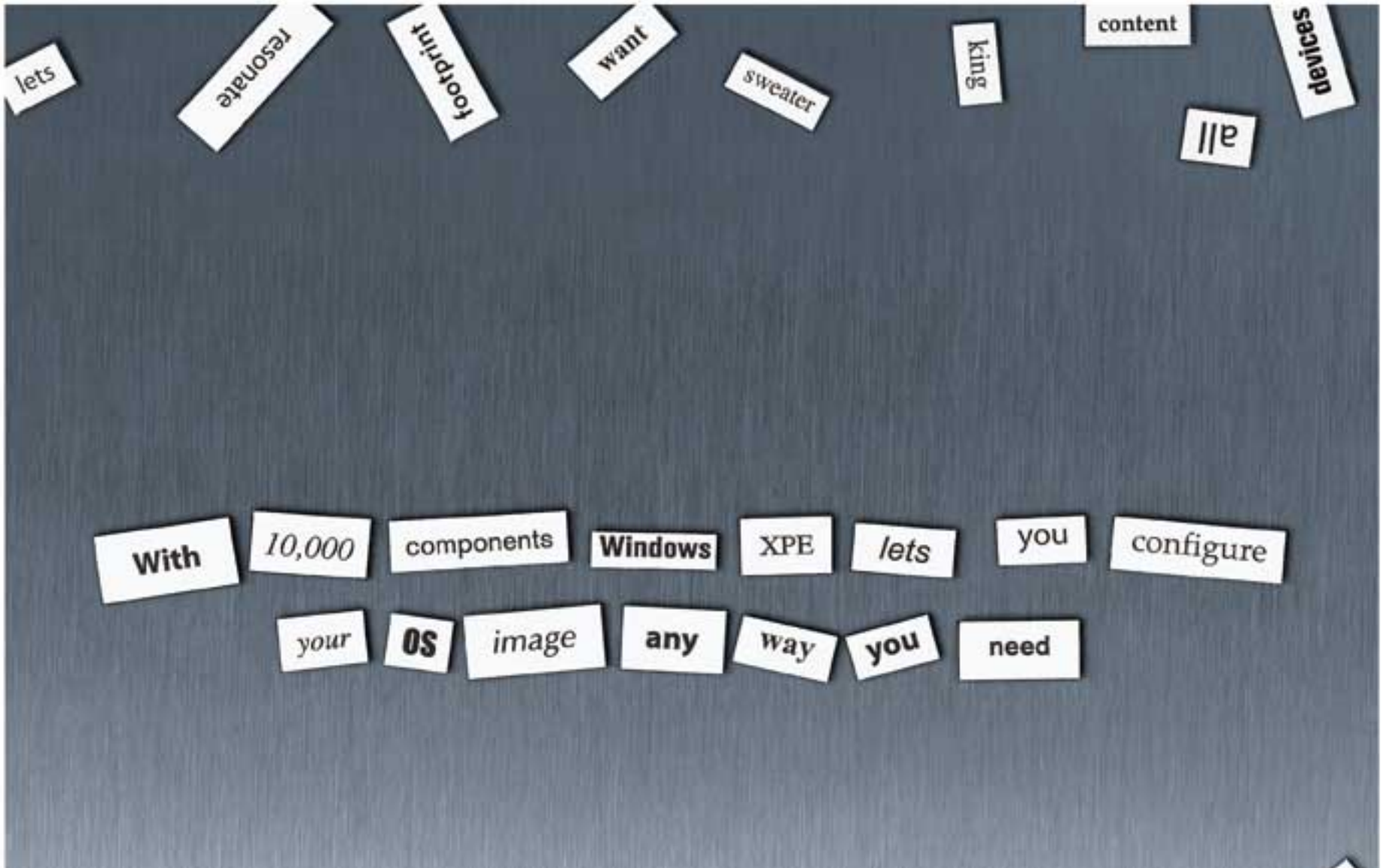
According to Henderson, the changeover seemed a natural one. "The transition has been really smooth. I just plunked down my existing management team into Mentor's RTOS operation," which he said had encompassed about 210 people, mostly in San Jose, Calif. As far as managing the two geographically dispersed groups, Henderson said, "our management structure is such that we are doing mostly engineering work in San Jose."

Henderson added that the plan will be to merge Mentor's Graphics XRAY debugger with ATI's codelab test suite, but it has not been decided how the new tools will be branded. He said that despite the merging of the tools, the company will continue to support all customers. "We're not going to leave anyone in the cold. We will support both lines for the foreseeable future."

Mentor's and ATI's debugging tools will merge, says Mentor's Henderson.

The company (www.mentor.com) also will continue to offer both Nucleus and VRTX, which Henderson said have differing strengths and applications. "VRTX is older technology, but has MMU capabilities and has more design wins. Nucleus is more widely ported," and is deployed heavily in telecommunications, networking, storage and automotive markets. He said VRTX is mostly found in aeronautics, medical, factory and industrial control systems, set-top boxes and consumer devices. Nucleus will continue to be offered without royalties.

Henderson was adamant about continuing to develop and support both operating systems. "I find it objectionable when companies acquire and discontinue a technology," he said, citing Wind River Systems Inc.'s acquisition two years ago of Integrated Systems Inc. and the subsequent phaseout of its pSOS operating system. "Companies lose all they've invested in developing for that RTOS" when it is abruptly discontinued, he said, adding that the mere process of selecting an RTOS can take as long as nine months. Mentor Graphics is headquartered in Wilsonville, Ore. ▮



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Wind River Releases Renewed BSD/OS

BY EDWARD J. CORREIA

Wind River Systems Inc. last month released BSD/OS 4.3, an enhanced version of BSD Unix it acquired from Berkeley Software Design Inc. in April 2001. The company also revealed its road map for future development of the operating system, which will include symmetric multiprocessing and support for PowerPC processors.

According to Roger Frey, senior product manager of server and storage products at Wind River (www.windriver.com), much of the development work since the acquisition of the operating system has been geared toward preparing it for embedded applications such as network-attached storage systems and server appliances. "These types of [applications] don't require real-time response," he said. Such new features include TCP/IP and rate filtering, network address translation, transparent FTP proxy, and support for IPv6, IPSec, Gigabit Ethernet and ROM-based file systems.

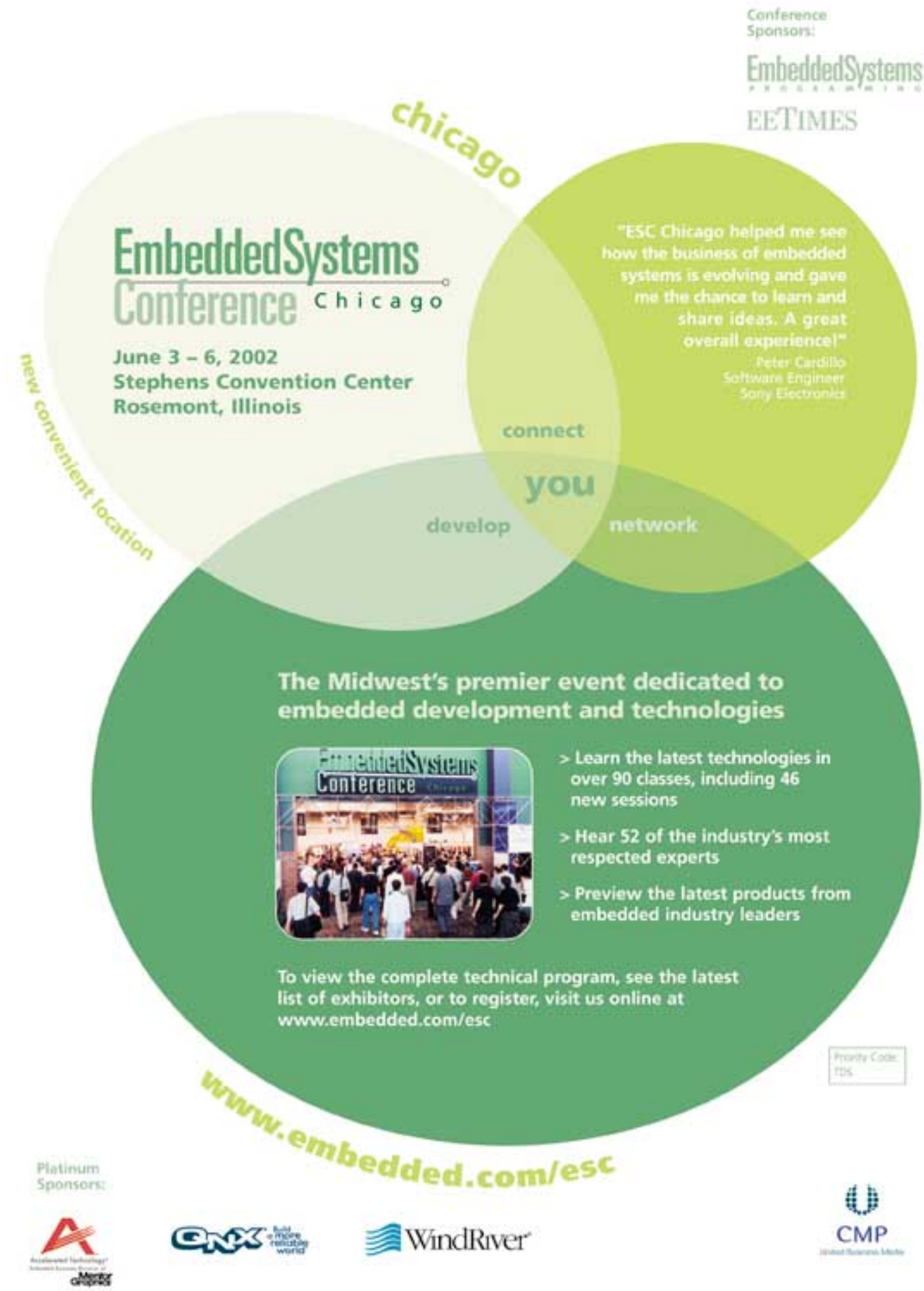
Frey said the new kernel also now supports fixed priority rate scheduling, a preboot execution environment (PXE) and a Linux compatibility layer. "We thought it would be helpful to allow our customers to take their Linux applications and run them on BSD/OS," he said.

According to Doug Urner, a technical marketing engineer in Wind River's Networks Business Unit, the version of PXE included with BSD/OS is a variation of Intel's specification that is integrated with Wind River's VisionWare bootloader and board driver development tools, and that also works with non-Intel chips. The environment benefits developers by permitting them to have their code execute before the operating system is loaded.

Urner claimed that additional benefits of PXE include the ability to configure servers to load their operating system centrally. "This means that a operator of a large facility, say a Web farm with tens of thousands of servers, can manage the configuration of those machines through a single boot server."

Though it is not intended for hard real-time applications, Urner said that fixed priority rate scheduling in BSD/OS now gives developers more control over when their tasks are executed. "This provides a modicum of real-time capability in BSD/OS, and enables a customer to accomplish tasks that have real-time requirements without having to use multiple OSes and CPUs in a single product."

Some of the most significant features of BSD/OS, according to Frey, are yet to come. "We're really putting most of our energies behind 5.0," which he said is scheduled for release in July. The next kernel will include symmetric multiprocessing with fine-grain locking, support for IBM and Motorola PowerPC processors, and board support packages for Wind River's PPM7400 and PPMC750 designs. Version 5.0 also will work with Tornado, Wind River's integrated development environment, Frey said. The developer version of BSD/OS costs $30,000 per project, plus per-device royalties. ▮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Pratt & Whitney Certifies Engine to DO-178B Level-A With Aonix® ObjectAda® / Raven™

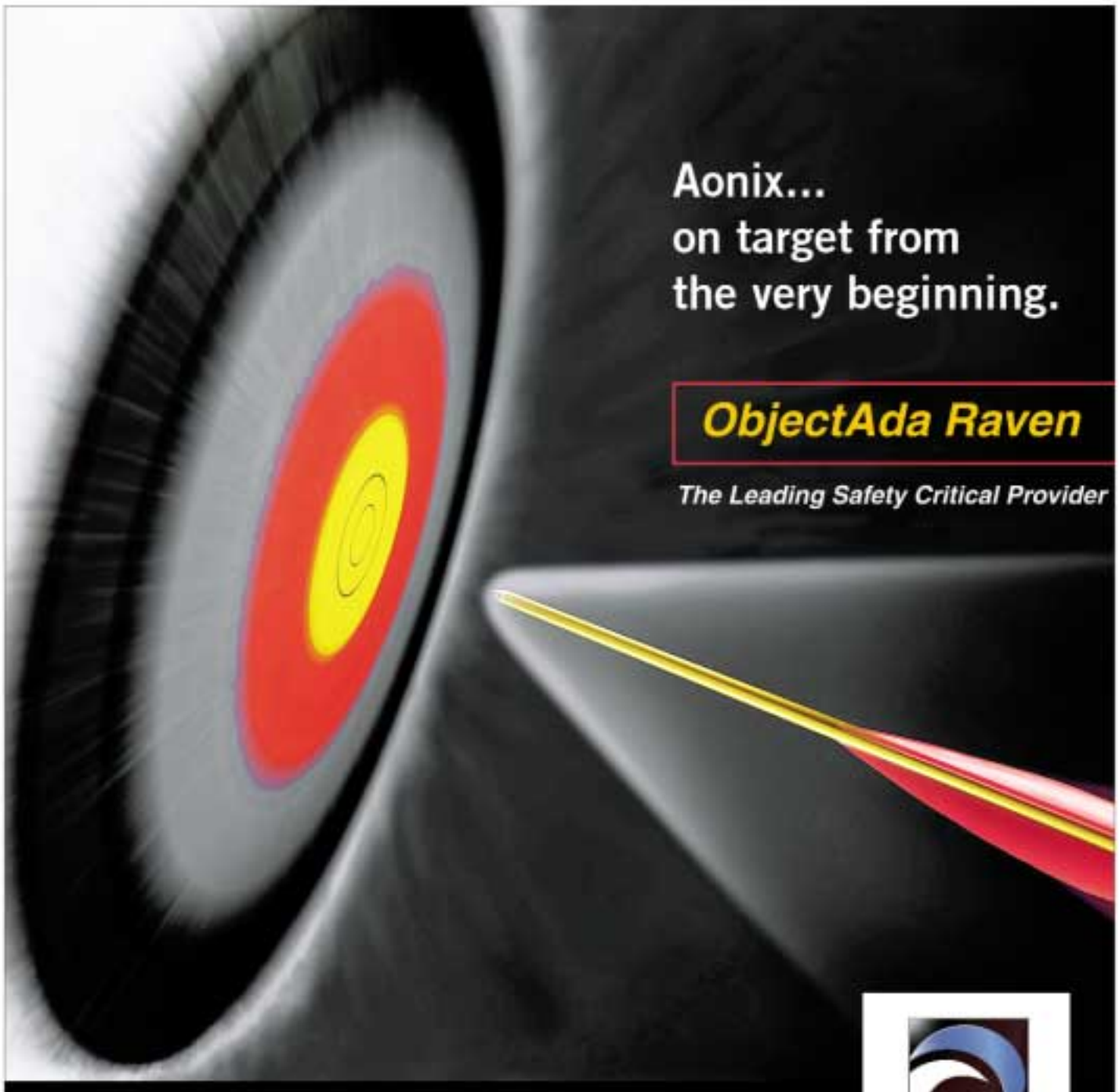
BOULDER, Colorado, January 24, 2002 - Aonix, a member of the Gores Technology Group and a leading provider of Ada 95 software development environments and safety critical solutions, has announced that Pratt & Whitney has successfully certified its newest commercial jet engine, the PW6000, using the **ObjectAda® / Raven™** runtime system.

The Pratt & Whitney certification was achieved at software Level-A of RTCA's DO-178B, Software Considerations in Airborne Systems and Equipment Certification. Certification to DO-178B requires that all COTS software included in the product be certified to the same standard as the core product. **ObjectAda/Raven** meets this standard for Level-A systems.

Pratt & Whitney incorporated the full suite of lifecycle artifacts provided by Aonix within the overall engine-system software documentation set approved for certification by the Federal Aviation Administration. By using the **ObjectAda/Raven** product and associated documentation, Pratt & Whitney was able to focus development efforts on its core competency of engine-system software, while ensuring that the run-time system portion of the product was developed and verified by experts in that domain. This approach reduced the schedule and technical risks associated with the program while also reducing development cost.

"Pratt & Whitney selected the **ObjectAda/Raven** product for use on the PW6000 in 1998 following an extensive evaluation. Aonix was selected for a variety of reasons including the usability of the tool set and the technical support that they were able to provide," states Bret Lynch, Manager, Real Time and Embedded Software for Pratt & Whitney. "The main discriminator, however, was the safety-critical domain experience of the company and their ability to meet the standards required for incorporation into a DO-178B Level-A software system."

*Aonix is the leading supplier of certifiable run-time systems for the Ada 83 language and offers the only certified Ada 95 run-time system. **ObjectAda/Raven** is certifiable to the highest certification levels and meets the **DO-178B Level-A** required by the FAA for airborne systems.*



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EDITORIAL

View From Wireless JavaOne

The wider aisles within this year's JavaOne conference vendor pavilion masked the reduced number of exhibitors but accentuated the reduced traffic flow. Although Sun Microsystems Inc. and conference producer Key3Media Group Inc. didn't release official figures, everyone agreed that attendance was down.

How much of that was due to the economy, how much to Sept. 11, and how much to a declining rate of change within the Java world? We believe all three share responsibility.

Look at Sun's announcements at the show. (SD Times' coverage of the seventh annual JavaOne, which occurred shortly before this newspaper went to press, will appear in the next issue). Most were focused on one narrow technology area: wireless computing. Given the number of Java-enabled wireless devices actually on the market, and the dearth of applications for them in mainstream computing, it's disconcerting to see that J2ME has become the apparent focal point of Sun's efforts, rather than desktop J2SE or server-side J2EE. Although there were some announcements regarding the iPlanet App Server, they were minimal compared with the wireless focus.

What did Sun introduce at its annual developer conference? A Java Specification Request, number 172, for extending Web services to wireless devices; a version of its Forte for Java development tool for J2ME applications; two new J2ME-compliant virtual machines for ARM processors; and a new information portal, wireless.java.sun.com, for you-know-what.

Interesting? Yes. Exciting? Perhaps, though it seemed that only Sharp Electronics Corp.'s booth was mobbed at JavaOne, where developers snapped up more than 2,200 Zaurus SL-5500 handheld computers, complete with WiFi card, for a show-only price of $299 each. All over the place, attendees were showing off their Zaurus computers, perhaps indicating that the interest in wireless for these enterprise developers doesn't lie in building service-provider applications for cellular phones.

Anyone looking for new technologies at JavaOne would have been severely disappointed. Sun did reveal that it had struck an agreement with Apache Software Foundation that would increase the open-source community's no-cost access to resources needed to develop independent versions of new specs. Although the Java Community Process executive committee heralded this as a breakthrough, none of the developers we talked to, who had paid to attend JavaOne presumably to learn how to build better business applications for their employers or for ISVs, seemed to care.

Even without exciting new products or emerging technologies, attendees might have benefited from getting an idea of Sun's future intentions for Java and its product line. That, too, was lacking; in keynotes and conversations, Sun executives seemed unable to answer the basic question "Where do Sun and Java go from here?" and could not fire up attendees' enthusiasm by presenting any sort of compelling vision or road map.

Given Sun's difficult position in the market—with Java under attack from .NET, with iPlanet being hammered by BEA, IBM and Oracle, and with Sun's hardware business threatened by Dell and IBM—Sun needs to look beyond its partners in the wireless market and remember that customers need to see more than handsets. They need to see a vision. ▮

GUEST VIEW

OPEN-SOURCE TSUNAMI

The recession is significantly strengthening the adoption of open-source technologies across the globe in corporations, organizations and governments. Open source has gained tremendous momentum. The open-source movement, with its paradigm shift and its appeal, is adding a jolt of excitement to what was thought to be an established and well-understood industry. A recession may even be good for the companies that ride this wave, resulting in their coming out much stronger in the market. Surf's up, dude.

SANDRA CANN

Open source allows products of a quality and flexibility never before seen to be produced—created by no one and everyone, using the world as a QA division. Now, many companies are basing their products on projects whose source code is given away for free! The developers who actually work to create the products benefit by collaboratively working with other developers on source code to meet their internal company needs.

The driving force behind open source is that it can evolve at an incredible pace when compared with conventional proprietary software development. The quality of the code can improve through the efforts of a larger pool of motivated talent. Enhancements can be more rapidly incorporated and redeployed to the user community, resulting in a significant reduction in overhead costs. The feedback loop between user requirements and programmer delivery is then dramatically shortened for faster response to today's accelerated time-to-market imperative. These collaborative benefits are also possible in non-open-source projects, as long as the source code and collaborative environment are available to developers.

Indeed, a tsunami is approaching, and only the innovative surfers in the market have seen it coming and are paddling out to ride it—while the proprietary companies are still on the beach. The open-source tsunami will change the industry landscape, radically shifting the companies on the beach and washing some away.

PARALLELS TO THE PAST

Look what is happening now, and let's draw some parallels to the tsunami in the 1980s that changed the industry: The advent of the PC redefined the marketplace, not to mention the demand for nonproprietary systems and a recession.

The tsunami event of the 1980s radically changed the landscape, and only the companies that adopted nonproprietary ways survived.

Look at the large companies then—where are those proprietary companies now? Burroughs, Honeywell, IBM, Sperry and Wang. Who would have thought that the industry would be so turned on its ear? Those that adapted to nonproprietary ways survived, joined by new

LETTERS TO THE EDITOR

GOOD INFO ON XP

Wayne Rash's column "Windows XP Is Here. Now What?" [Nov. 15, 2001, page 37, or at www.sdtimes.com/cols/webwatch_042.htm] is the only really informative article on XP I've seen so far. It tells you something that you don't find in a press release from Microsoft. Keep up the good work!

Hauke Wulff

ASSUMPTIONS INCORRECT

In response to Steven J. Vaughan-Nichols' column, ["Open, Closed and Web Services Standards," March 15, page 39, or at www.sdtimes.com/cols/javawatch_050.htm] I feel that the very bold assumptions regarding Microsoft and its .NET Framework are seriously incorrect. The fundamental core of .NET has nothing to do with Passport, nor is there any requirement for integration with that service. If you wish to take advantage of the .NET My Services (very specifically the .NET My Services), then sure, you may be forced to use their Passport service and pay their fees. All we need to do as system integrators and developers is choose to NOT use their specific services which tie us into Passport, and develop those components ourselves or tie ourselves into some complementary service provider.

The only thing that we are binding ourselves to when using the .NET Framework is the framework itself (some 200+ MB install) and nothing else. We choose to limit ourselves to its support for 23+ languages, its massive class library and its fully integrated support for Web services. We don't even need to tie ourselves into their development tool, Visual Studio .NET. Everything can be developed in Notepad, and compiled at the command line.

Sounds familiar, doesn't it? To use Java, you can simply begin with the JDK install and develop with Notepad and the command line. Java is not tied to any specific vendor, is it? When using something specific like CORBA or RMI, are you tied to any specific service that is similar to Passport? No. .NET follows these very same rules.

Regardless of the service provider that you choose to go with, either Microsoft's Passport or a competitor, you will always be forced to update your software when they update theirs. That is, if the vendor chooses to change its API, you will need to do so also. This is NOT a disadvantage of any one service provider; it is merely a sign of growth. In the software industry, in order to grow, we must change. In order to change, we must upgrade and develop new (most of the time better) interfaces for our systems to interact with, no matter who we are.

I would recommend that you take a closer look at the technology that you are attempting to criticize and see it for what it really is. Microsoft has always been blamed for never considering what the industry is doing or even caring enough to have a look. It would seem that most hard-core Java supporters, like you, are guilty of the very same crime. Microsoft has started to open its eyes to the world, why don't you? Once your eyes start to open up, you will see that Microsoft is pushing for full industry standard integration into its .NET Framework, and even in

PC companies in the ranks of the leaders.

There are three current market shifts that parallel those of 20 years ago: The advent of the Web is defining the marketplace again; there's a new demand for nonproprietary systems based on open standards; and again we have a recession.

This time around, some large companies that survived the first tsunami, like HP and IBM, are out front riding this wave. Other companies, like Microsoft, are still on the proprietary beach. IBM has a $2 billion commitment to promoting Linux. For the popular open-source communities that have created open standards, this is good news that further strengthens their presence in the marketplace. Again it will be the companies that adapt to nonproprietary open-standard ways that will survive, joined in the ranks by new Web technology companies and open-source organizations that work with communities to establish shared standards.

By contrast, Microsoft's price increases and tighter control are a strong contrast to the more open software practices. While this may be a calculated business decision for Microsoft, it may not be a well-thought-out strategic move in light of the economic conditions. Streamlining costs in operations has become critical. So amidst layoffs, there is a push for evaluating cheaper IT alternatives, thus further strengthening the acceptance of open source and open standards. Linux is free and is being installed on servers and desktops around the globe. Open-source communities often provide more effective support than can be found commercially because their support is representative of many more combinations of experience and crosses global time zones for 24/7 access—and it's free.

The benefits to organizations in open-source technologies start with reduced risk and reduced cost of project deployment. Open and shared standards assure tried-and-true quality, as code is built, tested and documented by hundreds of engineers. There are enhanced opportunities to leverage a repository of reusable application code. Companies can realize a faster and improved development process by increased utilization of staff across different project solutions.

It is logical that open source is used for building foundation technologies where establishing standards is valuable. Commercial products based on open-source standards are more likely to be interoperable and integrate in the larger IT scope. As more commercial products emerge built on open source, a new concept called "shared source" has emerged.

SHARED VS. OPEN SOURCE

Shared source is the same as open source except that it is not free. Most software companies today deliver their proprietary software to their customers as object code, in a form that only computers can understand. If a customer needs a change to the software that is critical to their business, their only choice is to request that the software provider make the change and hope for the best. What happens when that company goes out of business, as so many companies have in the past year?

Both open source and shared source are nonproprietary. Be careful of the Big Bad Wolf posing as Grandma. Some proprietary companies will lead you to believe they offer "shared source" but without the ability to change the source code. This unfortunately pollutes the term.

Look for the real thing. Shared source should offer access to the source code, and also can be modified. Customers have the software in a form that is readable, understandable and modifiable by any skilled software engineer. This gives the customer ultimate security, flexibility and control over their own destiny. Shared source, like open source, has the advantages of a networked collaborative community and a fast-paced software evolution putting control in the hands of the people. It's democratic software development.

Surf's up—let's catch a wave. ■

Sandra Cann is COO of Jcorporate Ltd., a maker of Java e-business components.

a lot of cases driving the industry into creating a better standard for us to work from, along with companies like IBM, HP and Oracle (WS-I, etc.).

Maybe you could provide some actual information to back up your claims. Show me exactly where we are tied into using Passport in .NET. Microsoft has recently stated that it is releasing the full source code for all of .NET; maybe you would like to have a look through it all and point out exactly where this forced limitation exists. Or if you like, you could always have a sneak peek with any of the available .NET disassemblers.

When choosing the environment, your choice should be limited to these two options: Tie yourself to one platform, but 23+ languages (Microsoft and .NET); or many platforms with the one language (Java). How often does your platform change in any given project? For me, close to never. I would rather have the flexibility in having my required skill set not be forced to the limitations of one language.

Robert Chartier
VP, Technology
Santra Technology

Steven J. Vaughan-Nichols has his facts wrong. He states that "to deliver Web services using .NET, [developers] need to buy into Microsoft's Passport service, which means that Web services consumers will need to have Passports."

This is not true. There are many examples of applications running today that use the .NET Framework to host and deliver Web services, yet do not require Passport for authentication or for any other reason. Developers can verify this themselves.

A quick referral to the .NET documentation, or to an actual .NET developer, would have avoided this error. Mr. Vaughan-Nichols does his readers and his magazine a disservice by delivering false information.

Dino Chiesa
Microsoft

I am writing in response to Steven J. Vaughan-Nichols' recent Java Watch column. I take issue with, and was disappointed to see, the following statement he makes in his column:

"Network developers are just beginning to notice that to deliver Web services using .NET, they need to buy into Microsoft's Passport service, which means that Web services consumers will need to have Passports. This means that everyone in their companies will need to authorize their use of an in-house network service by going out to Microsoft over the Internet."

This is totally false. There is nothing in the .NET Framework that forces you to use Passport when creating and publishing Web services. Passport is optional. I expect better from SD Times.

Daniel Read
www.DeveloperDotStar.com

Steven J. Vaughan-Nichols responds: While it's true that Windows developers can write and consume basic Web services using Visual Studio .NET, that's not how Microsoft is positioning its full Web services offering. Philip DesAutels, Microsoft's project manager for XML Web Services, told me that a full Web services program based on .NET does require Passport authorization, and that the company's vision for a full business solution for .NET-based Web services will use Passport for authorization. In fact, DesAutels positioned that as one of their solution's strongest points: the fact that with .NET, Web services authentication and security model (provided by Passport) is part and parcel of the whole.

BEST IDEA SINCE JAVA

Regarding your article ["JDO Is Good to Go," April 1, page 1, or at www.sdtimes.com/news/051/story2.htm], I've been waiting for this for about 10 years, when I started to develop software. This is the very best idea since Java itself! In my opinion, this is, by far, more important than .NET or Sun ONE.

Patrick Baumann

WHAT DO YOU THINK?

SD Times welcomes feedback. Letters must include the writer's name, company affiliation and contact information. Letters become the property of BZ Media and may be edited for space and style.

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CROSS-PLATFORM GUIs ON THE QT

If you write applications that need to run on multiple platforms, Java is not your only option. For years before anyone associated the term Java with computing, various companies were answering the siren's call for a cross-platform, natively compiled GUI toolkit that provided a robust set of components. The advantage of using such a toolkit, other than the pure portability of the code, was that, unlike Java, the applications were compiled and so they ran at full native speeds. In addition, the toolkits often extended the widget sets of each platform allowing developers to do things that native APIs could not do.

The trade-off was that developers had to learn the toolkit's model and many of its APIs in lieu of the native API sets, and sometimes in addition to. High-end toolkits generally provided so much functionality that they made it possible never to learn Win32 or Motif calls.

Cross-platform products have never fared as well commercially as they should have. The best-known players for many years were XVT, Galaxy from Visix Software and Zinc Software. Of these, only Zinc is robustly supported anymore and even then only on embedded devices by its parent (as of 1998), Wind River. This come-and-go phenomenon has made some IT managers skittish about committing to one toolkit, for fear that if it disappears their whole codebase may be jeopardized.

This is one of the reasons Qt from Norwegian firm Trolltech AS is so compelling. Qt has tackled IT concerns by making its product widely available. First of all, it comes with source code. Second, it's the basis for the KDE desktop in Linux. And third, it's available for free for noncommercial use. As a result, a very large, active and knowledgeable community supports the product over and above the support the company provides.

MIDDLEWARE WATCH

ANDREW BINSTOCK

Qt runs on Linux, all the big-name Unix variants, Windows and Mac OS X. In addition, the company provides embedded versions. However, what impresses one the most about Qt is not its large community of users or the number of platforms it supports, but the scope of the feature set and the quality of its implementation.

I have looked only at the Windows version, but the feature set is the same everywhere. It includes all standard widgets (windows, menus, toolbars, dialogs, checkboxes, buttons, icons, dials, tabs, data-entry forms and so forth). It also has rich text editing features. In fact, the text windows can be used for code editing—complete with syntax highlighting, or they can display HTML just as it would appear in a browser window. These capabilities are all multiple-document capable, as in MDI.

For advanced graphics, Qt supports 2D and 3D graphics, using OpenGL in the latter case. It also has a complete, callable help system, a table/spreadsheet capability, database access through SQL, direct support for XML, and a complete library of networking functions including APIs for sockets, TCP/IP, FTP and DNS look-ups.

By now, you should be getting the idea that just about anything a desktop application would want to do, it can do well with Qt. The Qt library is a replacement for Microsoft Foundation Classes, and in this respect it is roughly the same size and just as quick.

The package supports C++ coding and comes bundled with a screen/form designer, which generates code. Trying out Qt is not hard, the source code plus compilation scripts can be downloaded directly from www.trolltech.com and compiled on your workstation using the platform's native C++ compiler (Visual C++ in the case of Windows). As compared with Java, a big advantage of Qt is performance. It runs natively compiled code.

If the application your team is developing is released under GNU's GPL on Linux or Unix, you owe Trolltech nothing. Otherwise, you owe them several thousand dollars per developer seat. There are no runtime royalties. Fairly good documentation accompanies the product. More is available in O'Reilly & Associates' very solid guide, "Programming with Qt" (second edition) by Kalle Dalheimer.

As with any large toolkit such as Qt—be it MFC, Java or Motif—developers must spend time learning how the system is designed, how the API is laid out, and the peculiarities of each. The benefit is that if they already know C++, they only have to learn APIs—and completely portable APIs. When you consider that Visual C++ and Visual Basic programmers will need to make substantial changes to run existing code on Microsoft's .NET, examining Qt might suddenly make a lot of sense. ■

Andrew Binstock is the principal analyst at Pacific Data Works LLC.

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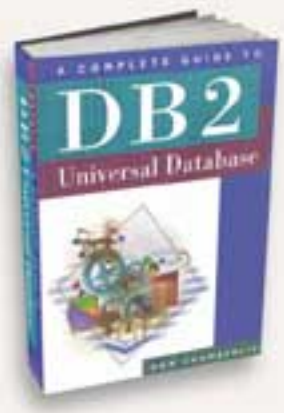

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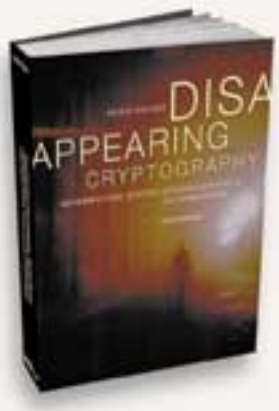

Mac OS X
Developer's Guide
Jesse Feiler

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NO MORE LAWSUITS!

I would pay good money to see Scott McNealy and Bill Gates in a steel-cage death match. I wouldn't spend a thin dime on Sun's latest Microsoft lawsuit.

For those of you who've been coding for the past month, Sun is claiming that Microsoft violated Section 1 of the Sherman Act by tying Internet Explorer browser to Windows, adding "Windows workgroup server operating systems" (Windows 2000/XP Professional) to its PC operating systems, incorporating IIS Web server into Windows NT/2000 Server, and incorporating the .NET Framework into all of its operating systems.

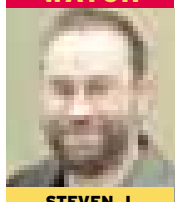
Oh yeah, and Sun also says that Microsoft has "entered into exclusive dealing and exclusionary agreements" with Apple and Intel to keep them from developing and distributing "a non-Microsoft compatible implementation of the Java platform." There's other stuff, too, but those issues are the heart of the matter.

Sound familiar? It should. Even if you've paid no attention to Microsoft's legal battles over the past few years, you'll doubtlessly know that most of these claims have been taken to court long before, and while Microsoft was found guilty, the punishment, while still being fought over, amounts to little more than a slap on the wrist. If you've paid closer attention, you might recall that AOL/Time Warner via its Netscape subsidiary launched a very similar suit against Microsoft this past January.

Bad Microsoft! Bad! Bad!

But so what? Sun wants the U.S. District Court to hit Microsoft with preliminary injunctions that will force them to include Sun's current Java plug-in with Windows XP and Internet Explorer. Sun also is asking the court to make Microsoft "stop the unlicensed distribution of Microsoft's JVM through separate Web downloads, instead of incorporating within Windows XP and Internet Explorer."

JAVA WATCH



STEVEN J. VAUGHAN-NICHOLS

And here's a new one: Sun wants Microsoft to "disclose and license proprietary interfaces, protocols and formats" and to unbundle Internet Explorer, IIS and the .NET Framework. While we're at it, in return for "the continuing harm that Sun has suffered as a result of Microsoft's illegal maintenance of monopolies over the PC operating system, Web browser, and office productivity suite markets, its unlawful attempt to monopolize the workgroup server market, and its unlawful exclusive dealing and tying practices," Sun wants triple damages, plus attorneys' fees, of course.

Is Sun going to get any of this? No, it's not. Mind you, Microsoft, despite Steve Ballmer's recent outrageous claims in a deposition on Feb. 8, isn't going to stop selling Windows, even if by some miracle a court imposes severe sanctions against the company.

What's Sun really afraid of? Digging into the documents, I found the key sentence: "If left unchecked to exploit the power of its monopoly position, Microsoft intends to use the .NET Framework to move its current monopoly in the PC operating system market into a more expansive and potentially more dangerous monopoly that encompasses software development on every computing device connected to the network."

Well, Sun's right. That could happen. Anyone who's ever tried to install XP and not get signed up to Passport, a part of .NET, in the process knows that Microsoft, in both very obvious and very subtle ways, tries to get you hooked into their systems.

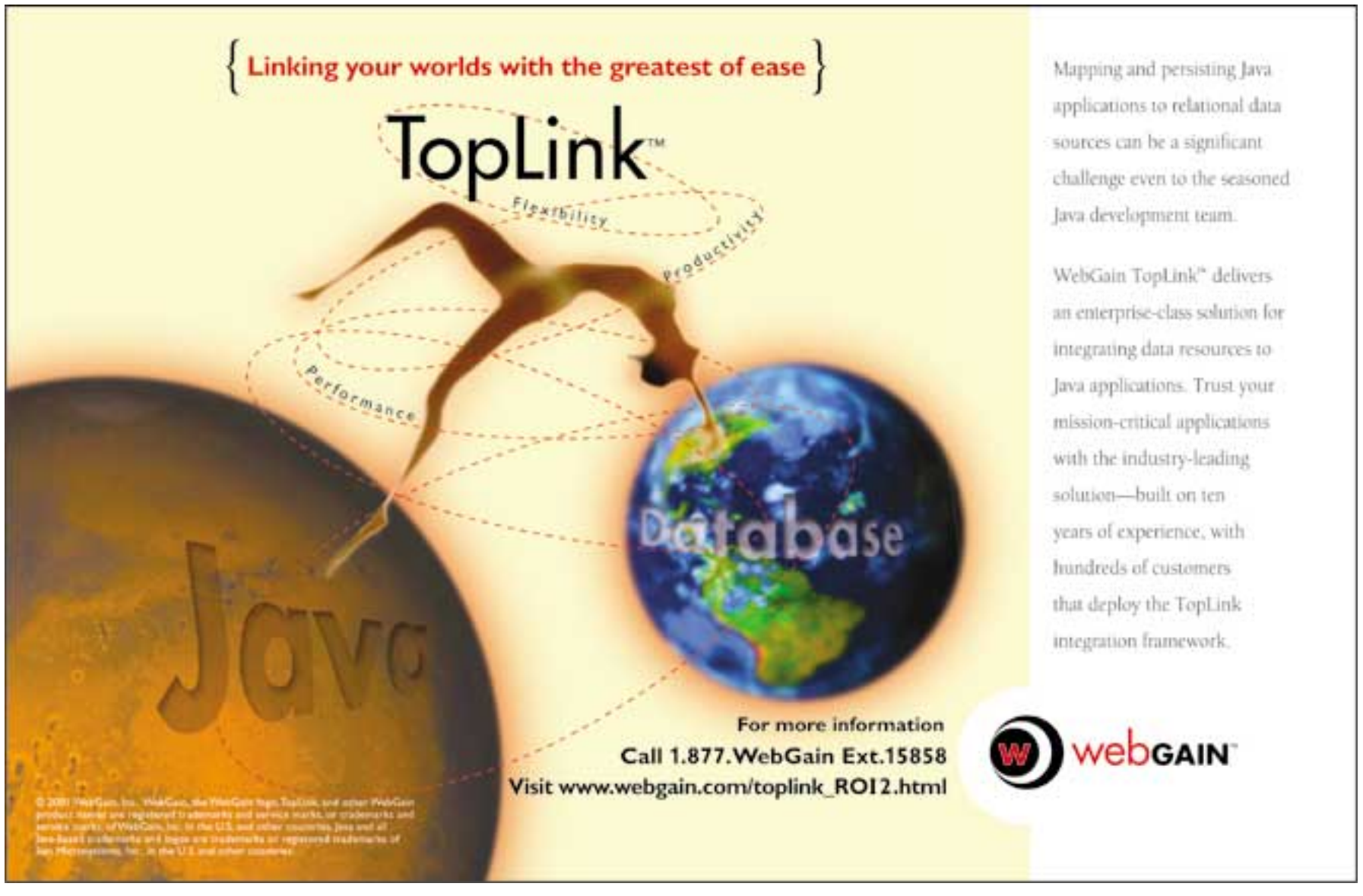
But, you know what? Suing Microsoft isn't going to win more Java development shops or sell more Sun Starfire servers. Yes, I think that Microsoft does engage in monopolistic practices, but I also have eyes. Did Netscape's winning the day in the Judge Penfield Jackson trial bring any users back to Netscape? Do you know many Windows users switching to Netscape 6 from Internet Explorer? I surely don't.

Besides, even if Sun does win, I really don't see any way that Microsoft can be forced into including someone's else software (specifically, Sun's JVM) on its systems. The only concrete benefit that Netscape has gotten out of its victory so far is that Microsoft can no longer strong-arm OEMs into leaving Netscape off their PCs. Neither Microsoft, the OEMs nor anyone else is *required* to include Netscape on its systems. No court victory is going to put the Sun JVM on new Windows PCs.

No, the only real winner here will be the corporate lawyers. We're talking millions, tens of millions, in fees for them. For us—the Java programmers and the software development managers—not a thing.

Instead of pouring money into a fruitless lawsuit, Sun should use that money to improve Java. Let's have more Sun developers, instead of Sun lawyers. Let's have more people pushing Java's advantages instead of complaining about .NET's flaws. By making Java the best possible development environment and letting people know about it, Sun, Java and all of us would fare far better. ▮

Steven J. Vaughan-Nichols has been writing about technology for more than 15 years and also has worked as a programmer for NASA and the Dept. of Defense.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BUY INSTEAD OF BUILD

HANOVER, GERMANY — In some ways, attending the world's largest trade show is surprising, and in some ways it's simply pleasant, at least when compared with other trade shows. Who, for example, can complain about a show where a substantial number of booths have second-story cocktail bars? There's something very civilized about a quiet chat with the public relations staff while being served a fine German beer. And what's even better is the ability to have that quiet chat. Apparently European work rules require strictly enforced sound levels, meaning that unlike shows in the U.S., you can actually hear yourself think.

This might explain my agreeable mood as I wandered through the aisles last month in one of the many CeBit pavilions devoted to software and software development. I didn't mind that there were more than 30 separate show halls, making the Hanover show the biggest in the world by far. Despite my general focus on booths containing coffee bars (I was planning to wait until afternoon for the beer), I was pleased to see a number of software development companies focusing on creating software development engines or application engines aimed at developers. In fact, the more I looked, the more I realized that this was a trend: applications that didn't need to be developed, but rather could simply be used.

An excellent example, and one that is known in the U.S., is Data Access Worldwide's (www.dataaccess.com) WebApp Studio and Server, version 3.0. The German office of Data Access Corp. was showing the product, which is intended to give Web developers a way to access information in their corporate databases without having to write everything themselves. Instead, the WebApp Studio lets you create the client portion that delivers the query using the browser. The query goes to the WebApp Server, which in turn queries your SQL database and returns the results to the user making the request.

For the developer, such an approach has some real benefits, not the least of which is providing a way to query the database without having to hire a database specialist to help code your Web site. In addition, the extra layer of insulation, and the fact that the WebApp server provides the only connection between the Web and your data, means that your data is much more secure than it probably would be if you were doing this yourself and going against your database directly.

After a long discussion in somewhat tortured English, I continued to stroll. I saw more development tools, more engines, more ways to connect things directly into your Web services. Clearly, XML was making an impact in Europe and, from the looks of the products being shown, elsewhere as well.

One example of the breadth of the development offerings was Cognitec AG's FaceVACS (www.cognitec-ag.de). This is a facial recognition product that's available in many forms, one of which is a recognition engine that you can include in your Web development effort. You can also use the product in completed applications, including one that will work with all of your security and surveillance cameras, and one that will allow people to log on to their computers or enter protected areas merely by looking at a camera.

But assuming that you want to do something besides monitor your security cameras or let people log on without passwords, it's the development platform you're likely to want to see. You can create Web-based front ends that will support everything from image collection and cataloging to security monitoring to other sorts of identification and facial image processing. As far as I could tell, the extent of its capabilities is up more to your imagination than to the limitations of the engine.

It's worth noting that despite being put to the ultimate test—recognizing my face in its much jet-lagged form—the product survived.

What's important, though, isn't whether either of these products might fit into your Web development solution. Rather, it's that these products are showing up in increasing numbers. No longer do you have to give up on plans that would require development skills beyond the capabilities of your staff and the consultants you could hire. Instead, you can do things in your development environment that could never be done before.

Now, at least, you can build Web sites that really meet your needs. One of the reasons that the Web sites of the past were less useful and less interesting than you might wish was the lack of a means to provide the capabilities you really needed. Now, with a variety of special purpose engines and applications designed to fit into your Web development environment, you can meet those needs and still keep the development effort on track and on a reasonably sized budget. And, of course, you now have the excuse you've needed to make the trip to Hanover at CeBit time. For the software, of course. The beer is incidental. ▮

Wayne Rash is a technology journalist and consultant.

COM ALIVE AND WELL

A key goal of Microsoft's .NET Framework is the advancement of component-style software architectures. Recently, I had a discussion with a semi-irate development manager who was lamenting his previous investments in COM programming and training expenses because he now considered that technology to be worm food.

Not so. COM is alive and well and will be for some time. Its days are certainly numbered, but that number is definitely not a single integer, but a ripe three digits. The reason COM is alive and well, even with Microsoft's fierce push of .NET, is that framework's evolutionary extension of COM technology, and specifically its inclusion of managed and unmanaged code.

Managed code is anything that requires the use of the Common Language Runtime (CLR) for execution—which basically means it had to have been created within the .NET Framework. Unmanaged code is .NET's bridge to other software platforms as well as legacy code. This places it outside CLR's sphere of influence. The unmanaged code concept was really a requirement for Microsoft if it wanted to give .NET any real chance of survival. Too many powerful and advanced technologies exist today outside not only .NET's purview but Redmond's entirely for the company to get away with offering a new platform in a vacuum. Unmanaged code is Microsoft's way of acknowledging that other worthwhile technologies exist without having to break stride in its march to conquer the globe.

.NET applications can call on unmanaged code for data communication as well as internal functionality. All a .NET programmer needs to do is grant the unmanaged morsel code permission, and his application can access, communicate or run another non-.NET app using mixed-mode C++ programming, JUMP, PInvoke or (you guessed it) COM.

As a granddaddy language, C++ has a little more oomph than other languages in the .NET arsenal, and mixed-mode programming is one of its perks. This basically lets programmers recompile even existing C++ code using .NET's CLR, with the result being managed code. This allows C++ programmers to "mix" unmanaged and managed code within the same application. JUMP refers to the Java User Migration Path to .NET, which revolves mostly around Visual J# .NET. Platform Invocation Services (PInvoke) is simply a feature of CLR that allows managed code to link back to unmanaged Win32 APIs.

But, by far, the richest unmanaged communication capabilities have been reserved for COM and COM+ objects. First off, .NET is specifically designed to allow its components to communicate with COM/COM+ objects and services. The .NET Framework SDK even carries command line tools again designed specifically to enable COM interoperability; and the framework also contains a number of Interop APIs designed to enable COM interoperability without requiring any COM-specific programming. A chunk of this is handled by .NET's use of object wrappers.

The Runtime Callable Wrapper (RCW) surrounds COM objects and fools .NET objects into thinking they're dealing with native code; while the COM Callable Wrapper (CCW) surrounds a .NET object and fools COM objects into thinking they're dealing with another COM brother. What's neat here is that, for the most part, this wrapper communication can work without the need for specific additional coding. .NET and Visual Studio .NET allow programmers to create wrappers with standard object syntax and the creation of the internal object will happen in the background.

Indeed, both the .NET Framework and Visual Studio .NET seem designed to make COM interoperability practically invisible to .NET developers. Frankly, that could be both a good and bad thing, but we can argue that point another time. Visual Studio .NET, for example, will allow seamless interaction between legacy COM and a .NET application as though the COM object were managed code. The .NET Framework SDK, for its part, also contains COM-oriented tools such as utilities that automatically generate type information for either style of wrapper.

Because of the interoperability technologies described above, especially Visual Studio .NET, COM objects are by far the most favored of the unmanaged children. And within Visual Studio .NET, all its associated languages, especially C# and Visual Basic .NET, still contain features and capabilities designed specifically to build COM/COM+ components in addition to managed code.

Basically, Microsoft is showing no indications of ignoring or killing off COM/COM+ anytime soon, which should really be obvious considering how many existing Microsoft applications and operating systems have COM as their DNA. If anything, the object-oriented goals of COM are really only extended in .NET, not revolutionized. True, we'll see COM being slowly phased out as .NET matures, but that process will be measured in years. ▮

Oliver Rist is a freelance technology journalist and vice president of technology at AIC Inc.

CAPITAL IDEAS STILL AROUND

While pundits proclaim that the recession is ending and the country is starting to rebound, companies continue to report that losses are piling up, and so is the number of people without jobs. Trade shows report attendance off by 50 percent and more from just a year or two ago. Industry magazines are folding faster than lanterns at an origami contest.

INDUSTRY WATCH

DAVID RUBINSTEIN

And while this next piece of news would seem to illustrate the economy is not yet back to where it was two years ago, it also shows a few rays of hope for what will be two years from now.

Research by Calif.-based funding reporting service VentureWire reveals that venture capital investments have decreased for the seventh consecutive quarter. Their numbers show that 445 companies received $5 billion in funding for the first quarter of 2002.

Five billion may sound like a lot, but compare it with the fourth quarter of 2001, when 628 companies garnered $6.7 billion, or even to the first quarter of 2001, when 908 companies received almost $13 billion, and you see that financiers are being more cautious than in the recent past about which companies will get funded.

So where's the hope, you ask? I've got your hope right here. According to VentureWire, enterprise software was the most popular sector for venture investors, as 68 financings were closed to the tune of $477 million. (Biotech was second with 53 deals.) "Enterprise software should not require tons of cash to get the company to have a product," said Lou Volpe of Kodiak Venture Partners in the VentureWire report. He expects heavy spending in this sector this year and next.

This is very good news indeed. It points to the critical nature of computer technology, and shows that while not every Internet specialty soap vendor should have received funding, there is no denying that technological advances will drive business decisions into the foreseeable future. Not only does it not take truckloads of cash to bring a product out, but the return on investment that piece of technology can provide makes it even more alluring. It has been during this most recent recession that technology companies have been demonstrating new ways to do business electronically. And, because the economic slowdown prevented many businesses from becoming early adopters, these technologies have had time to mature, to be understood. The companies being funded now are the ones that in a few years will truly revolutionize the way software is developed and deployed and used by businesses in ever-evolving national and global economies.

Not all the deals make headlines, but all are significant signs that investment in enterprise software is thriving. As reported in SD Times, WebSphere partner Perficient Inc. received $7.9 million in January; component reuse solution provider Flashline.com Inc. received $6 million in February; and Systinet Corp. received $21 million in March to further develop its Web Applications and Services Platform.

It is important to note that companies have had their infrastructures in place for a number of years now, and it's getting to be time to move into Web services implementations, buying into either J2EE or .NET. This is the enterprise software—along with business process management, data integration and transformation, application development architectures and frameworks—that allows businesses to interact with customers and partners in a more personalized yet flexible and responsive way. The money is there, according to VentureWire, but it is being doled out more selectively as VC funds more closely tend to their portfolios.

What about the dot-coms, which led the way three years ago before leaving venture capitalists to try to climb out of the carnage? It appears VCs are done with consumer e-commerce companies, as only two were funded in the first quarter, compared with 22 one year ago. However, Internet service companies are successfully raising funds, with 64 companies getting $438 million.

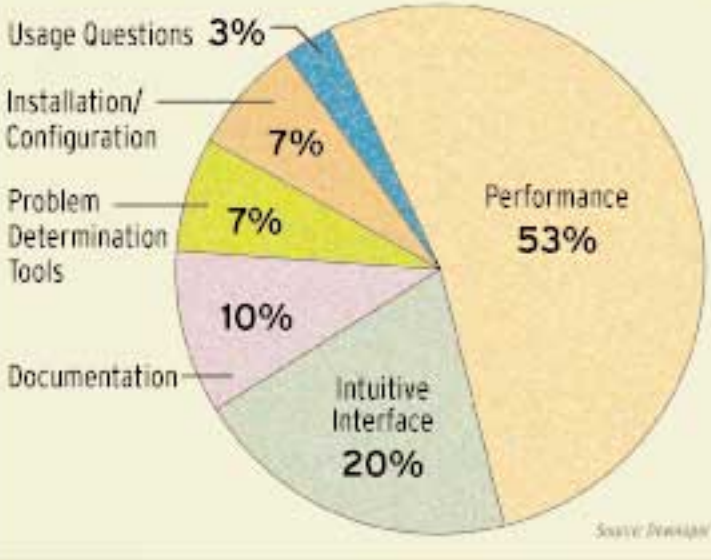
Another interesting trend pointed out in the report is that venture firms are doing more expansion-stage rounds of funding and fewer first-round deals, tending to their portfolios more closely to prevent the blow-ups of the recent past. The lesson of the dot-coms: There is less risk in pouring money into something that's even moderately established than there is in backing a start-up. As a result of this type of thinking, venture investors funded 115 second-round deals and 104 third-round deals for a grand total of $2.7 billion. Meanwhile, 92 first-round deals and seven "seed" deals landed merely $440 million—although in the report Kodiak's Volpe said he believes more first-round fundings will occur through the rest of the year.

Not surprisingly, Silicon Valley was the top region for the number of venture fundings, with 82 companies receiving $1.3 billion. New York was second with 47 deals for $514 million, while Boston (45 deals, $558 million) was third. ▮

David Rubinstein is executive editor of SD Times.

What Has the Biggest Impact on Developers' Perception of Software Quality, Assuming Few Bugs?

EVANS DATA WATCH



Perhaps your end users just "know it when they see it," but can we quantify what the consumer of a piece of software considers important for quality? Automobile manufacturers reputedly use a solid-sounding door closure to convey the quality of manufacturing. What about software? Rather than a solid *kechunk* of a CD-ROM drive door, performance is the leading indicator of a quality product, according to software developers—assuming that the product is not plagued with bugs.

In fact, more than half of those recently surveyed, 53 percent, said that performance had the biggest impact on their views of a product's quality.

Next, with 20 percent, was intuitive interface—if you can't figure it out, the problem must be in the software. Documentation was seen as most important by only one out of 10 developers, and other factors, including tools for problem determination and the ease of installation, each came in well under 10 percent.

Source: Developer Marketing Patterns Annual August 2002, EVANS DATA CORP. www.evansdata.com

BUSINESS BRIEFS

Corel Corp. has completed its acquisition of **SoftQuad Software Ltd.**, whose technology forms the basis for Corel's DeepWhite strategy of leveraging XML with Web content creation and enterprise process management. Corel was to issue about 11.1 million shares, or just better than half a share for each SoftQuad share, to close the deal . . . Mobile application infrastructure provider **Covigo Inc.** has received $6 million in funding from investors **Levensohn Capital**, **Nokia Ventures** and **Norwest Ventures**. This brings the total amount of venture capital raised by the company since it was created in 1999 to $20.5 million . . . **TimeSys Corp.** has secured $15.5 million in funding, led by **Adams Capital Management**. The funds will allow TimeSys to bring to market its design and analysis tools for real-time functionality within embedded Linux and Java applications . . . Linux vendor **Red Hat Inc.** lost $41.9 million, or 25 cents per share, during the fourth quarter of fiscal year 2001 ended Feb. 28. That compares with a loss of $24.2 million, or 14 cents per share, a year earlier. Based on generally accepted accounting procedures, the company lost almost $140 million, or 83 cents per share, for the year; it lost $86.7 million (53 cents per share) for fiscal year 2000. Revenues for 2001 were $78.9 million, down 2 percent from 2000, the company reported. ▮

CALENDAR OF EVENTS

Internet World April 22–26
Los Angeles
PENTON MEDIA INC.
www.internetworld.com/events/spring2002

Software Development Conference April 22–26
San Jose, Calif.
CMP MEDIA LLC
www.sdexpo.com

Enterprise Wireless Forum April 29–May 1
Santa Clara, Calif.
INT MEDIA GROUP
http://seminars.internet.com/ewf/spring02/index.html

Embedded Processor Forum April 29–May 2
San Jose, Calif.
MICRODESIGN RESOURCES
www.mdronline.com/epf

Symposium/ITxpo April 29–May 2
San Diego
GARTNER INC.
www3.gartner.com/2_events/symposium/spg4/spg4.html

Emerging Technology Conference May 13–16
Santa Clara, Calif.
O'REILLY & ASSOCIATES INC.
http://conferences.oreillynet.com/etcon2002

Star East May 13–17
Orlando, Fla.
SOFTWARE QUALITY ENGINEERING
www.sqe.com/stareast

Borland Conference May 18–22
Anaheim, Calif.
BORLAND SOFTWARE CORP.
www.borland.com/conf2002

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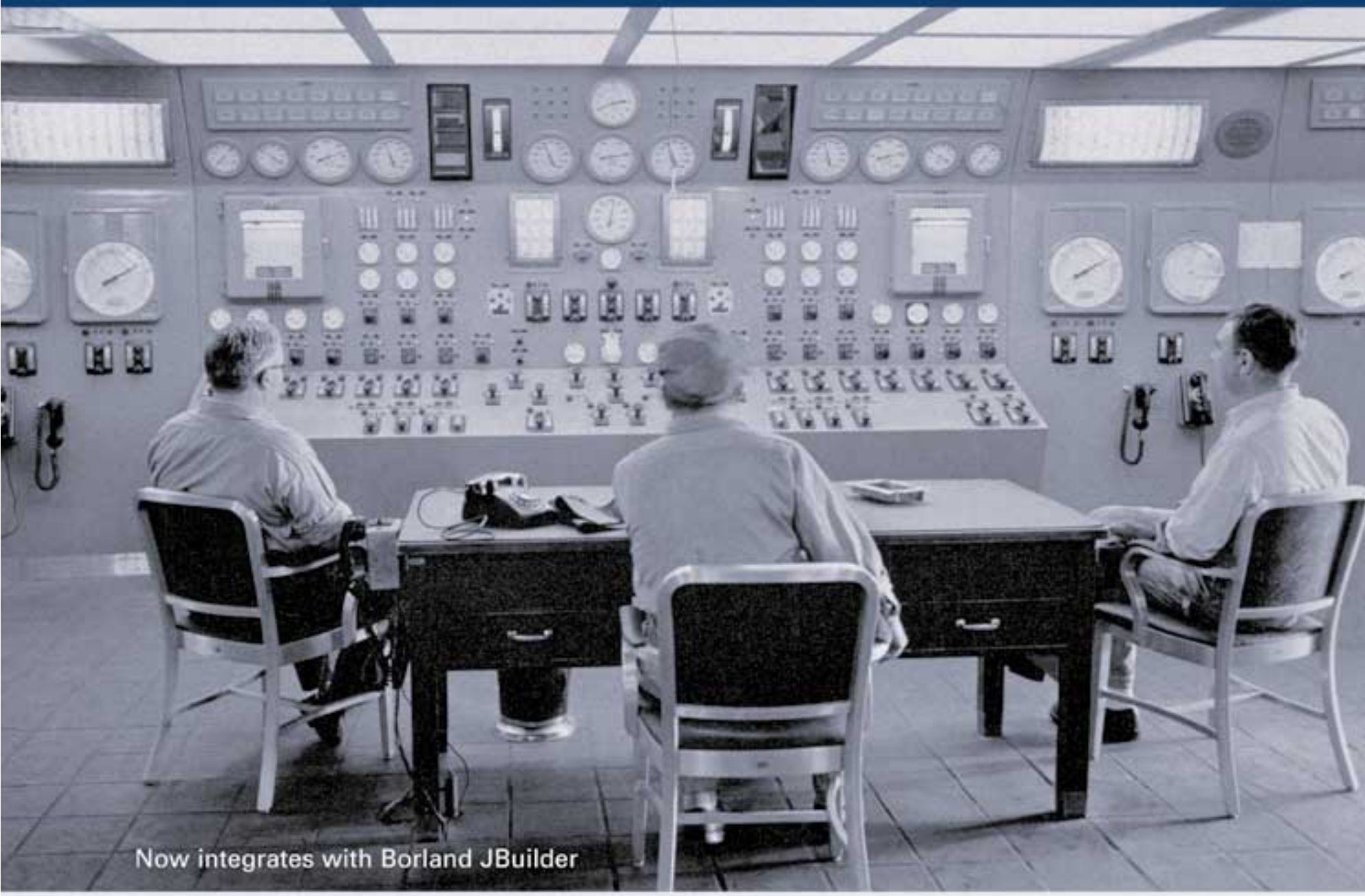

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